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ABSTRACT

These proceedings include 83 papers and 24 abstracts of papers contributed at the AIR's Annual Forum. Practitioners at two- and four-year colleges and universities, public and private (teachers, department chairmen, and administrators) as well as theoreticians are addressed. Papers fall into 13 categories: (1) presidential address and theme elaboration; (2) planning and management analysis; (3) financial analysis; (4) faculty evaluation, analysis, and development; (5) decision strategies for management; (6) program budgeting; (7) state level planning and analysis; (8) affirmative action and consumer protection; (9) student admission, retention, and follow-up; (10) institutional research: theory and technique; (11) consensus developing techniques; (12) simulation models and management information systems; and (13) course and curriculum analysis. (MSE)

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15th Annual Forum
St. Louis, Missouri

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The Association for Institutional Research

15th ANNUAL FORUM

THE ASSOCIATION FOR INSTITUTIONAL RESEARCH

April 28—May 1, 1975
St. Louis, Missouri

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1974—Public Policy: Issues and Analyses
1975—Information for Decisions in Postsecondary Education

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Preface and Acknowledgements

There is no question in my mind about this year's contributions to the Annual Forum being the best in quality the Association has had the privilege of preparing for the membership and for the increasingly wide audience of nonmember administrators, faculty members, and students who are finding the *Proceedings* useful in their work and study. Not only is the general quality better, but also the range of topics is substantially more varied than in at least the two most recent years.

As this is my last year as *Proceedings* editor, I wish to thank the Publications Board for unfailing support; thank the contributors of papers for their willingness to allow me and the Proceedings Editorial Committee to sometimes edit their work substantially; thank the many who have helped select and review contributed papers over the last three years; and, finally, to express special appreciation to Anne-Marie McCartan, and also to Stan Rowell, Judy Richardson and Jean Chulak for their personal assistance in getting the material from manuscript to print.

University of Washington

1975 Robert G. Cope

CONTENTS

PRESIDENTIAL ADDRESS AND THEME ELABORATION

THE ART OF THE STATE

Lois E. Torrence, University of Connecticut 1

INSTITUTIONAL RESEARCH IN A POSTSECONDARY WORLD

Lyman Glenny, University of California-Berkeley 6

THE TRANSACTIONAL FRAME OF INFORMATION

William M. Sibley, The University of Manitoba 12

PLANNING AND MANAGEMENT ANALYSIS

INFORMATION USEFUL FOR ACADEMIC DEPARTMENT PLANNING AND MANAGEMENT

Glenn K. Miyataki and Robert G. Gray, National Center for Higher Education Management Systems 17

THE RELATIONSHIP BETWEEN ORGANIZATIONAL VARIABLES AND INNOVATIVE PRACTICES IN SMALLER PRIVATE LIBERAL ARTS COLLEGES IN THE STATE OF OHIO

John J. Bowers, Research for Better Schools, Inc. 22

MANAGERIAL GROWTH IN HIGHER EDUCATION: IS THE TAIL WAGGING THE DOG?

Irving H. Buchen, Fairleigh Dickinson University 27

INFORMATION NEEDS IN SUPPORT OF PLANNING IN SMALL COLLEGES

Stanley M. Frame, Azusa Pacific College 32

SPACE PLANNING: REPLACING MYTHS WITH FACTS

James R. Montgomery, Beatrice T. Mahan, and Gerald W. McLaughlin, Virginia Polytechnic Institute and State University 35

FINANCIAL ANALYSIS

A PERFORMANCE INDEX FOR USE IN COMPARATIVE BUDGET ANALYSIS

John E. Stecklein, University of Minnesota 42

FORMULA FUNDING OF HIGHER EDUCATION IN THE UNITED STATES: AN OVERVIEW OF THE STATE-OF-THE-ART

Francis M. Gross, The University of Tennessee at Martin 47

SOME EXAMPLES OF COST-BENEFITS AND COST-EFFECTIVENESS ANALYSES IN THE PLANNING OF HIGHER EDUCATION INSTITUTIONS IN PORTUGAL

J.J.R. Fraústo da Silva, Maria Emília Freire, and J.P. Martins Barata,
Universidade Nova de Lisboa, Portugal 52

PROGRAM COST ANALYSIS BY SIMULATION

Kenneth L. Kutina, Case Western Reserve University 57

IMPROVING FINANCIAL ANALYSIS AND DECISION-MAKING IN INSTITUTIONS OF POSTSECONDARY EDUCATION

James L. Murdock, University of Michigan-Flint
Dale A. Davis, Eastern Michigan University 62

FACULTY EVALUATION, ANALYSIS, AND DEVELOPMENT

A COMMITTED RESOURCES APPROACH TO FACULTY STAFFING POLICIES

Stefan D. Bloomfield, Oregon State University 69

AN ANALYTICAL APPROACH TO THE PATHOLOGY OF ACADEMIC DEPARTMENTS

William A. Simpson, Michigan State University 73

OPTIMIZING FACULTY STAFFING DECISIONS IN CHANGING AND CONFLICTING CONDITIONS

Charles H. Belanger, University of Montreal
F. Craig Johnson, Florida State University 78

STUDENT RATINGS—AN INFORMATION SOURCE FOR DECISION-MAKING

Doris Burton, Indiana University 83

TENURE AND PROMOTION: A COMPARATIVE SIMULATION

John Goveia, Willamette University 87

FACULTY DEVELOPMENT: AN INSTITUTIONAL PARADOX

Burnedetta Kincy-Bates, Institute for Services to Education 90

A DYNAMIC SYSTEM FOR ADJUSTING FACULTY TEACHING BEHAVIOR AND UNIVERSITY GOALS IN THE GENERAL EDUCATION CURRICULUM

Donald F. Lawson and J.R. Cunningham, Humboldt State University 94

THE CRITICAL INCIDENT TECHNIQUE IN EVALUATING COLLEGE TEACHING

Ann A. Rhodes and Roberta D. Brown, Arkansas College 99

FACULTY DEVELOPMENT IN HIGHER EDUCATION: FROM MYTHS TO RESEARCH FINDINGS

Robert G. Simerly, Syracuse University 103

ADMINISTRATIVE EVALUATION BY FACULTY

Charles H. Farmer and Elaine Mann, University of Tulsa 107

DECISION STRATEGIES FOR MANAGEMENT: A SEMINAR

AN ANALYSIS OF DECISION STRATEGIES EMPLOYED IN THE GOVERNANCE OF HIGHER EDUCATION

Frank A. Schmidtlein, Center for Research and Development in Higher Education 111

A DECENTRALIZED APPROACH TO THE MANAGEMENT OF A COMPLEX RESEARCH UNIVERSITY

Lattie F. Coor, Washington University 117

MANAGERIAL STYLES AND DECISION-MAKING IN HIGHER EDUCATION

Warren W. Gulko and Pauline F. Lukens, University of Massachusetts 122

PROGRAM BUDGETING: A SEMINAR

THE PROGRAM BUDGETING EXPERIENCE IN WISCONSIN

Elwin F. Cammack, University of Wisconsin System 125

COMPREHENSIVE PLANNING IN STATE LEVEL DECISION-MAKING FOR HIGHER EDUCATION

Paul E. Lingenfelter, Illinois Board of Higher Education 127

PROGRAM BUDGETING: AN EVALUATION FROM ACADEMIC PLANNING, BUDGETING, AND SYSTEM PERSPECTIVES

Arthur L. Gillis, University of California-San Francisco 134

STATE LEVEL PLANNING AND ANALYSIS

DATA FOR STATE BUDGETARY DECISIONS: ARE CENTRALIZED HIGHER INFORMATION SYSTEMS WORKING?

Richard J. Meisinger, Jr. and Ralph A. Purves, University of California-Berkeley 136

HUMAN CAPITAL, THE RATE OF RETURN ON INVESTMENT IN EDUCATION, AND THE EFFICIENT ALLOCATION OF RESOURCES: CALIFORNIA AS A CASE

Bernard Kalscheuer and G. Frederick Thompson, Department of Finance, California 141

A REPORT ON THE IMPLEMENTATION OF POSTSECONDARY BUDGET REVIEW IN MINNESOTA

Robert J. Rustad and Neal M. Burns, Minnesota Higher Education Coordinating Commission 153

THE FRUITS AND FRUSTRATIONS OF STATEWIDE COOPERATIVE RESEARCH EFFORTS

Michael O. Stewart, Peru State College 158

DATA, RESPONSE TIME AND FREQUENCY OF USE: A STATEWIDE SERVICE ANALYSIS

James J. McGovern, Connecticut Commission for Higher Education 161

PRELIMINARY STATE LEVEL PLANNING FOR HIGHER EDUCATION RETRENCHMENT

Larry K. Hayes, Oklahoma State Regents for Higher Education 165

STATEWIDE SYSTEMS FOR COOPERATIVE COMPUTING: BREAKING DOWN THE BARRIERS TO COMMUNICATION AND RESOURCE SHARING

Donald M. Norris, The Center for the Study of Higher Education
Richard B. Heydinger, Formative Evaluation Research Associates 169

STATEWIDE DATA COLLECTION FOR DECISION-MAKING: THE KANSAS SCENE. FACT, FICTION, FRACTION, FRUSTRATION, FRICTION OR FRUITION?

J. Stanley Laughlin, Emporia Kansas State College 175

LONG-RANGE PHYSICAL PLANNING IN KANSAS

George M. Platt, Wichita State University 180

FACULTY ACTIVITY IN KANSAS

Donald H. Tarrant, Kansas State University 184

AFFIRMATIVE ACTION AND CONSUMER PROTECTION

FROM POLICY TO IMPLEMENTATION: A PROBLEM SOLVING APPROACH TO AFFIRMATIVE ACTION

Denise Strenglein, University of South Florida 187

MEASURING THE BENEFITS OF GRADUATE STUDIES AMONG BLACKS: DIFFERING PERSPECTIVES

Annie R. Hayes, Federal City College 194

THE FUTURE OF POSTSECONDARY EDUCATION FOR BLACK AMERICANS

James E. Lyons, Fayetteville State University 199

ALUMNI FOLLOW-UP STUDY OF SEVENTEEN TRADITIONALLY BLACK INSTITUTIONS
William N. Pruitt and Harding Faulk, Institute for Services to Education
and the Consortium for Curriculum Change and Institutional Research 204

WHAT WE KNOW ABOUT EDUCATIONAL PRODUCTIVITY

David R. Witmer, The University of Wisconsin-La Crosse 209

LET THE BUYER BEWARE: EDUCATIONAL INNOVATION AND CONSUMER PROTECTION

Claudine Schweber-Koren, National Institute of Education 215

PUBLIC OPINION RESEARCH: QUICK, BUT NOT SO DIRTY

Patrick T. Terenzini, Syracuse University 218

RESTRUCTURING POSTSECONDARY EDUCATION

B. Everard Blanchard, Villa Educational Research Associates 221

STUDENT ADMISSION, RETENTION, AND FOLLOW-UP

ORGANIZING THE MARKETING FOCUS IN HIGHER EDUCATION

Eugene H. Fram, Rochester Institute of Technology 224

AN EXAMINATION OF ABILITY TO PAY AND COLLEGE ATTENDANCE COSTS ACCEPTED BY THE STUDENT AND THE FAMILY

Larry G. Jones, The University of Georgia 227

LET US END THE TUITION DEBATE

Robert Winter, University of Illinois, Champaign 233

MEASURING STUDENT SUCCESS

Klaus Strigl and Roland Traunmueller, Johannes-Kepler University, Linz, Austria 239

THE CORRELATES OF UNDERGRADUATE STUDENT ATTRITION AT THE UNIVERSITY OF MIAMI (FLORIDA)

Matt W. Steele, University of Miami 245

STUDENT REACTIONS TO COLLEGE: HOW STUDENTS FEEL ABOUT THEIR COLLEGE EXPERIENCES

Walter T. Schoen, Jr., Educational Testing Service 249

THEY DO COME BACK! ENROLLMENT TRACKING AT THE COMMUNITY COLLEGE

E. Timothy Lightfield, Mercer County Community College 253

AIDING THE ARTICULATION PROCESS: A JUNIOR COLLEGE TRANSFER STUDENT INFORMATION SYSTEM

Gerald S. Leischuck, Auburn University 260

STUDENT FLOW AT THE COMMUNITY COLLEGE

Paul G. Larkin, Prince George's Community College 266

PREDICTING STUDENT ATTRITION

Harry J. Knopke, University of Wisconsin-Madison 269

THE STUDY OF GRADUATES OF POSTSECONDARY INSTITUTIONS: A SEARCH FOR THE PRODUCTS OF HIGHER EDUCATION

Ralph E. Henard, The University of Colorado at Denver 273

SLOWING STUDENT ATTRITION: AN ACTION RESEARCH PROJECT ON ACADEMIC ADVISING

Dennis L. Bates, Drake University 278

ATTRITION AT A NONTRADITIONAL INSTITUTION

A. Paul Bradley, Jr. and Timothy Lehmann, Empire State College 283

STATISTICAL COMPARISON OF ENTRANCE PREDICTION EQUATIONS USING ACT OR SAT SCORES OR BOTH

H. Bruce Higley, Larry L. Adams, and Leland H. Campbell, Brigham Young University 289

A LONGITUDINAL STUDY OF ASSOCIATE DEGREE GRADUATES: A MECHANISM FOR PROGRAM ASSESSMENT

Edward Mann, Pennsylvania State University 294

INSTITUTIONAL RESEARCH: THEORY AND TECHNIQUE

STATEMENTS OF ETHICS AND VALUES IN INSTITUTIONAL RESEARCH: A SEMINAR

Joe L. Saupe, University of Missouri
Sidney Suslow, University of California, Berkeley
James W. Firnberg, Louisiana State University System
Warren W. Gulko, University of Massachusetts
Paul L. Dressel and Thomas M. Freeman, Michigan State University 300

INSTITUTIONAL RESEARCH DATA FOR "WHAT" DECISIONS?: RESULTS OF A SURVEY OF INSTITUTIONAL RESEARCH PRACTICES IN CANADA, UNITED STATES, WESTERN EUROPE AND AUSTRALIA

Gilles G. Nadeau Universite de Moncton and McGill University 307

INSTITUTIONAL RESEARCH: DOES IT MAKE A DIFFERENCE?

Joseph Martin, Institute for Services to Education 316

MODELS-TOOLS OR CONTROLLERS

Frank R. Borchert, Jr., Case Western Reserve University 320

PROGRAM EVALUATION: FROM QUESTION TO IMPACT

Arthur L. Gillis, University of California
Ray A. Muston, University of Iowa 322

CONSENSUS DEVELOPING TECHNIQUES

LINKING DATA TO DECISIONS: OPERATIONALIZING CONCEPTS IN INSTITUTIONAL GOAL DEVELOPMENT

Carl L. Harshman, St. Louis University 328

OPERATING STRATEGIES FOR DELPHI EXERCISES

Robert Judd, Troy State University 336

A FOLLOW-UP OF A DELPHI STUDY

Norman P. Uhl, North Carolina Central University 339

DELPHI REVISITED

Robert J. Parden, University of Santa Clara 341

A TWO TIME USER LOOKS AT THE DELPHI TECHNIQUE IN HIGHER EDUCATION

W. Keith Evans, Portland State University 344

CONSENSUS BETWEEN INTERNAL AND EXTERNAL CONSTITUENCIES CONCERNING INSTITUTIONAL GOALS

James C. Flint, Wenatchee Valley College 351

INFORMATION INPUTS TO DECISIONS ON UNIVERSITY MISSION

Robert C. Shirley, University of Houston 355

SIMULATION MODELS AND MANAGEMENT INFORMATION SYSTEMS

THE INSTITUTIONALIZATION OF INFORMATION SYSTEMS: OR, WHAT WE NEED TO LEARN BEYOND NCHEMS

Dwight C. Smith, Jr., State University of New York at Albany 361

STRATEGIES FOR ACCEPTANCE AND UTILIZATION OF SIMULATION MODELING AS A MECHANISM FOR FACILITATING STAFFING REDUCTIONS: A CASE STUDY

Jim Nichols, Concord College and Bluefield State College 365

A MODEL FOR ESTIMATING THE RANGE OF OUTCOMES OF SPECIFIED TYPES OF POLICIES BEFORE AND AFTER ADOPTION OR IMPLEMENTATION

David H. Zippin, Fairleigh Dickinson University 371

THE EFFECTIVENESS OF COMPUTER PLANNING MODELS IN PLANNING FOR MEDICAL CENTERS

Frank S. Zilm, Stone, Marraccini and Patterson 376

PREPARING THE TWO-YEAR COLLEGE FOR ACCOUNTABILITY

Gary A. Rice, Yakima Valley College 380

IDENTIFYING COMMUNITY IN COMMUNITY COLLEGE

Joseph Rossmeier, Northern Virginia Community College
Mantha Vlahos, Broward Community College
Gary A. Rice, Yakima Valley College 388

COURSE AND CURRICULUM ANALYSIS

GROUP INTERACTION USED TO ACHIEVE THE DESIRED OUTCOME IN A COMPETENCY-BASED COURSE

Nathan R. Keith, Jr. and David E. Suddick, Governors State University 391

EVALUATION OF ONE TYPE OF NON-TRADITIONAL PROGRAM IN HIGHER EDUCATION

L. La Mar Adams, Leland H. Campbell, Ray Alvord, and John Seggar, Brigham Young University 394

A RESPONSE TO THE NEED FOR "META-THEORY" IN EDUCATIONAL PLANNING: THE PRECEPTS AND APPLICATIONS OF THE PERRY SCHEME OF DEVELOPMENT

James M. Heffernan, Syracuse University 400

ADDITIONAL CONTRIBUTED PAPERS: ABSTRACTS 406

Editor's note: Figures and Exhibits accompanying the texts in this volume were reproduced from copy provided by the authors.

THE ART OF THE STATE

Lois E. Torrence
University of Connecticut

About two years ago, a report titled "Data and Decision-Making in Postsecondary Education" (1973) was issued. This was one of several reports prepared by a task force established by the Department of Health, Education and Welfare and chaired by Frank Newman (then of Stanford University, now at the University of Rhode Island). This report was issued at the same time as the task force report on graduate education—a volatile topic—with the result that the report related to data and decision-making was over shadowed. I had hoped that the Association for Institutional Research (AIR)—as the professional association most directly concerned—might prepare a response which would be both supportive and/or critical, as appropriate. An AIR response was not feasible but I believe a few comments—even as a personal reaction from the perspective of one concerned with the institutions of higher education—are quite in order at a Forum with the theme of this one.

The focus of the task force report, as might be expected, was on data for *federal* decision-making and the theme was that data on postsecondary education are neither adequate nor readily available. To illustrate the kind of data needed for federal decision-making, the report was organized around four questions: What is a "college"? Who goes to college? What happens there? and What are the results? With respect to each question, the report concluded that there are massive gaps in the information available. I have no difficulty concurring with most of the general points: we do need more meaningful classifications of institutions and we can no longer ignore the non-collegiate portion of postsecondary training and educational activities; we do need to know more about the students who enter collegiate institutions, those who enter proprietary schools, and those who do not continue beyond high school; we do need more research on the educational process and better understanding of the impact of the different environments in which the educational process thrives; and we do need more information on the "results" of the various collegiate or other postsecondary experiences as well as on the respective costs.

I also concur with the three recommendations of the task force: a) creation of a federal postsecondary education statistical agency with specific responsibilities for collection, analysis, and dissemination of data; b) continuation of basic Higher Education General Information Surveys (HEGIS), but additional funding for detailed surveys based on samples and for longitudinal studies of high priority; and c) expansion of the constituency of data users.

I do disagree on some details of the task force report, both as to fact and as to concept. For example, the report contended that institutional administrators and lobbyists are major users of HEGIS data and have unduly influenced both the subjects to be surveyed and the formats to be used. Quite to the contrary, the AIR *ad hoc* Committee on Access to Federal Data was explicitly informed in 1970-71 and, subsequently, that final decisions on HEGIS subjects and content were more heavily dependent on the priorities expressed by fellow federal agencies than those of institutional representatives. Disagreement with such specifics does not, of course, preclude general support of the points made in the task force report.

In spite of the fact that the report did not receive very much public attention, I believe it has been a significant factor in the long-time effort to improve the federal higher education data collection, analysis and dissemination. Over the past few months we have seen the relocation of the National Center for Education Statistics from the Office of Education to the office of the Assistant Secretary for Education, and there have been changes in the leadership as well as reassessment of program priorities within NCES. These changes auger well for an improved data capability. But I would like to have us think carefully about the nature and uses of data—especially at federal policymaking levels, both executive and legislative.

Since the mid-1960s the absence of adequate, timely, and readily available federally collected data meant that Congress turned to the education associations for information and analysis needed in the policymaking process. Although political activity *per se* is precluded for tax exempt institutions and associations, the legislature expected the special interest spokesmen—as is customary with Washington lobbies—to deluge Congress with relevant facts and with sophisticated analyses related to the issues. But as Robert Andringa (1973), Minority Staff Director of the House Committee on Education and Labor, has stated quite bluntly: "The higher education community did not provide the desired research and analytical effort to support the legislative process" (p. 12). Andringa concludes that "The politics, sociology, and economics of national policy with respect to higher education receive an amazingly low priority among the nation's intellectuals" (p. 12). I agree with this latter conclusion—and would extend the observation to the state, and, indeed, the institutional policymaking levels as well.

But I would challenge what appears to be an underlying assumption at the federal policymaking level—namely, that there, in fact, can be an entity called, variously, higher education or postsecondary education. There is no such entity. There can and must be a substantial community of common interest but as long as high value is placed on diversity in higher education, there will be no entity—at least not voluntarily.

The Washington-based higher education associations are reflections of the multi-faceted special interests within higher education. Among the types of associations are: a) the organizations with institutional (meaning, usually, presidential) membership some of which cut across all types of institutions, while others are limited to private institutions, to public institutions, or to community colleges; b) the position oriented professional associations, such as the National Association of College and University Business Officers (NACUBO) and the American Association of Collegiate Registrars and Admissions Officers (AACRAO); c) the disciplinary-based associations, such as the American Political Science Association (APSA), and the American Psychological Association (APA); and d) an astonishingly large group of organizations that cut across lines and reflect various slices of the higher education pie, such as American Association of University Professors (AAUP), the Council of Graduate Schools (CGS) and Federation of Regional Accrediting Commissions for Higher Education (FRACHE). Various non-profit and commercial groups add to the variety of higher education interest groups. And, of course, many associations and organizations located outside Washington provide still other perspectives on higher education.

Throughout most of the 1960s—the years of rapid growth for higher education—the federal interest took the form of support for construction, for organized research, and for graduate student assistance in various forms. None of these programs threatened any substantial special interests and the associations representing such interests were rarely forced to take positions at odds with other groups. Indeed, if I may borrow from the philology of Lewis Carroll's "Through The Looking Glass," I would characterize the higher education Washington lobby as an "un-lobby." As programs were periodically reconsidered, federal policymakers found it difficult to talk with an "un-lobby."

Today, higher education associations are reorganizing to give greater emphasis to the role of policy analysis, and they are taking positions—but, with a few exceptions, each still responds primarily from the perspective of a special interest. There has been a shrillness to some of the dialogue between representatives of certain segments of higher education that simply serves to reinforce the federal policy maker's reluctance to depend on the organized structures of the higher education community for sound advice.

These and, no doubt, other factors led Dr. Andringa to propose creation of an "independent research and analysis" capability with the objective of assisting "legislators and government planners at both the state and federal levels" (p. 12). His goal would be a research organization staffed with the best policy researchers money could buy and meriting the rubric of "The Brookings" or "The Rand" of postsecondary education. According to Andringa such an organization should be free from control by any existing associations (but it should be financed, in part, by assessments on those associations choosing to affiliate), it should have multiple sources of funding, and it should be "guided in its policy decisions by an advisory council made up primarily of Congressmen, executive-branch officials, state legislators and governors, and other policy-makers in need of the center's research" (p. 12). While a center for policy research has merit, the idea of an advisory council to guide *policy decisions*—especially with the composition suggested—would certainly remove such a center from the rank of a Brookings-like institution.

National Policy Analysis

In recent months the need for national policy analysis has been recognized by the Carnegie Commission which has established a Council on Policy Studies on Higher Education and by the American Council on Education which has developed a Policy Analysis Service. The American Council on Education also has been attempting to pull together higher education survey data from a wide variety of sources. Another national data source has evolved from the staff work in support of the National Commission on the Financing of Postsecondary Education. The updating of this data base will be the responsibility of National Center for Educational Statistics (NCES). Virtually all of the discussions of information and analysis for use in higher education policy decisions emphasize the need for significant change in or addition to present federal data collection. In fact, as we well know, there have been numerous additions to federal data collection over the past few years. I need mention only one area—equal opportunity/affirmative action—to illustrate my point. The federal statutes and regulations have dispersed responsibility for these areas among several departments and agencies with concomitant dispersal of reporting requirements. I understand that the Internal Revenue Service expects to join this group of agencies by requiring private institutions, if they wish to keep their tax exempt status, to keep extensive records, by racial origin, and to file reports on all requests for admission, financial aid, and employment—all for the purpose of being able to prove nondiscrimination. But these various reporting requirements have little or nothing to do with the *establishment* of policy. They are, instead, a part of the monitoring and policing procedures which need to be utilized to ensure adherence to established policy. However, I do fear that heavy-handedness by way of multiplicity in federal requirements for record keeping and reporting tend to divert institutional engeries from the very important substantive issues encompassed in, as in this example, the concept of equal opportunity/affirmative action.

Perhaps we can arrange to have some specific higher education involvement in a mind-boggling new Commission which was created by Congress last December—The National Commission on Federal Paperwork. The Commission was not yet functioning in mid-April because the President had not made his appointments—may we assume that the "paperwork" is the cause of the delay? Seriously, the charge to the commission is very broad and with the anticipated staff of from 30 to 80, perhaps the 2-year life will enable them to make a little headway on a massive problem.

The federal interest affecting higher education extends to new areas with discouraging regularity. Are you aware that the Office of Education has promulgated regulations which are being called "consumer protection" rules which will be applicable to both non-profit and proprietary institutions which enroll students who hold federally guaranteed loans (*Federal Register*, 1975). As I read these rules, they seem to be directed toward institutions which have had high default rates among their students, but the rules do apply, of course, to all institutions with students participating in the Guaranteed Student Loan Program. Included in the regulations are such requirements as the following: Prospective students must be presented with a "complete and accurate statement . . . about the institution . . . its faculties and facilities." Institutions offering programs intended "to prepare students for a particular vocation, trade or career field" must include information regarding employment in the field including average starting salaries of previous students—although regional or national data may be used if "after a reasonable effort" the institution cannot provide its own data. "Career field" is interpreted to include college, graduate or professional school programs. Teaching is the example given, but presumably also included as "career fields" would be nursing, law, engineering—the list could be long. In a different vein, the rules provide that the Commissioner of Education *may* "require reasonable and appropriate measures to alleviate" any of several conditions which might have an adverse effect on the student loan program. One of these specified conditions is a current or operating fund deficit in the most recent fiscal year. If the Commissioner has some suggestion for alleviating this condition, I suspect most of the private institutions in the country would hope that he would come forward—and quickly!

I assume this set of regulations is the forerunner of others in the consumer protection area. I would certainly agree with the contention that some institutions do use misleading advertising, that catalogues are not always paragons of truth—but will the proposed remedies be designed to prevent real abuse or will they be overwhelming for *all* institutions regardless of the care with which they treat their responsibilities to students?

Congress

It would seem, at times, that Congress has the same difficulty distinguishing between policymaking and administration as, on occasion, do our higher education boards of trustees. Did you read in mid-April about the amendment to the House of Representatives bill authorizing 1976 funding for the National Science Foundation (NSF)? Under this amendment, the Director of NSF would be required to submit to Congress each 30 days a list of all proposed grants. Either chamber could disapprove any proposal during the subsequent 30-day period. Consider for a moment the nature of a national basic research effort in which every project is tailored to avoid a Congressional line item veto! This bill has not yet—insofar as I know—passed the Senate, and I can only hope that it will not do so.

One recent development which may have more impact on higher education public policy than any other single factor is the recent appointment of Alice Rivlin as staff director of the new Congressional Budget Office. Her responsibilities encompass all federal matters and her ability to cut through peripheral issues to the heart of a question should be of tremendous value in the staff support of the budgetary and appropriations processes in Congress. Her special knowledge of higher education is simply an added value.

Creation of public policy for higher education is unquestionably a difficult task whether it is at the federal or at a state or local level. It is especially difficult in the context of the higher education system or systems in the United States. If you will mentally draw a matrix reflecting all of the potential intersecting points in the higher education decision making of the federal government, 50 state governments, and hundreds of local governments, and then if you will superimpose 3 categories of institutions—public, private and proprietary—on this matrix, you will get some feel for the complexities involved.

The policymaking process at the state level is not the same as at the federal level. With the exception of the service academies and a very few other institutions, the federal government does not adopt policy or make appropriations for *individual* institutions or systems. The policy analysis required at the state level will, in most cases, differ substantially from that needed federally. And the impact of policies—whether federal or state—on the private sector is much more apparent and meaningful in the context of the smaller geographic area of the state.

Any attempt to generalize concerning the relationships between public institutions and, indeed, between private institutions and the policymaking bodies within each of the 50 states would be foolhardy. Nevertheless, decision-making at the state level probably has more day-to-day impact on our institutions than any other level—often including, I am afraid, our institutional decision-making processes. Having spent most of my career in private institutions of higher education, I am reading and listening with fascination to the stories of the ways in which state legislators and executive officers arrive at decisions. I also find that there are vast differences in the roles played by state coordinating agencies or commissions—ranging from serving as the sole spokesman for the state's public institutions, to serving as a screening body for budgetary requests but without any prohibition on institutional lobbying for different priorities and funding.

The halcyon days of full funding and of institutional autonomy are at least temporarily over for most public institutions. The impact of state decisions on private institutions may be less direct—but there is an impact.

State Approaches

To meet their higher education information needs, states have adopted a variety of approaches. Many state agencies now serve as collection points for at least the HEGIS surveys and often for other institutional reports prepared for federal agencies. But since these reports are not predicated on, or reflective of, a coherent national policy for higher education and since the 50 state policies differ from each other, copies of federal reports would not appear to have high utility for policymakers at the state level. We do know that most state agencies have developed their own reporting requirements for institutions—and that, in many state, legislatures and executive branches have felt the need to make requests for additional information.

From the perspective of a faculty member at a state university (University of California, Berkeley), Professor Martin Trow (1975) deplores the growth of modern management systems with their "powerful leveling forces" and contends that

> A good deal of what has made universities really creative has been a function of bad data collection. Much of the best as well as the worst in higher education has flourished in decent obscurity. Obscurity allows for diverse practices to develop in different fields and areas. . . . Data reveal inequalities which, once seen, must be either justified or abolished. . . .
>
> We ought at least to entertain the possibility that it is not in a university's own best interests to gather "good"—i.e., systematic and recurrent—data on as many of its own internal operations as possible. . .
>
> Better data, generated by better data *systems*, are demanded . . . by governmental authorities most often on the grounds of the public's interest in better "accountability." But I believe it is not in the public interest for the private life of universities to be managed closely by remote state officials. (pp. 123-124)

Professor Trow's position on the role of the state is, I am sure, familiar to anyone currently employed on a campus, whether public or private.

The concepts of institutional autonomy and public accountability appear to be irreconcilable. In my opionion, neither concept can be maintained in its purest form—but each is essential for the continued existence of higher education. The dilemma of defining a compatible balance between the two is exacerbated in times of financial stress and challenges to credibility. Accountability today is too closely tied to quantification, to routine procedures, and to doubts about good faith. Institutional autonomy is too closely tied to breaches of good faith, to failure to adhere to state purposes, and to less adequate management skills.

We are in a difficult and potentially dynamic period for higher education. Institutional identity is blurred as systemwide offices grow; the public and private dichotomy is obscured as public funds flow to private institutions and as private gifts to public institutions increase; state responsibility for education is tempered as federal programs evolve. The President-designate of the University of California System, Dr. David S. Saxon, was recently quoted as agreeing with Kingman Brewster of Yale that there is an increasing tendency of the federal government to use spending power to determine educational policies. Dr. Saxon went on to say: "One of the most interesting things to me about this is that, from the point of view of the federal government, all universities are public universities essentially. Stanford—or Harvard—to the federal government is just as much a public university as U.C.L.A. or Berkeley is. So, everybody's in the same boat (*Chronicle of Higher Education*, 1975, p. 7). John R. Silber (1975), President of Boston University, states that ". . . we should cease to speak of public and private higher education. We should speak rather of privately-sponsored versus taxpayer-sponsored institutions, or of *independent* as contrasted to *state* institutions (pp. 33-40). Carol Van Alstyne (1974), Chief Economist, American Council on Education, in a discussion of student financial aid and tuition policies, points out that we may "be surprised to discover a possible shift in the locus of postsecondary educational decisions toward the federal from the state levels of government (p. 57). She further notes that national policy proposals may not consider carefully enough "the *federal* nature of higher education in this country . . . [that is, the] 50 different state situations (p. 55). These contravening tendencies do nothing to ease the tasks of the decision makers.

It is my belief that the information and policy analysis needed for decisions should differ at the state and at the federal levels—and that policy analysis on the institutional level may be quite a different activity. Perhaps we could make a very constructive contribution by identifying—from the perspective of higher education—the information and analysis which we feel should be considered in the policymaking process in each of these contexts. But I suspect our greatest contribution would be in helping define the kinds of data *relevant to* policy issues and the reporting techniques which will be most supportive of evaluation of policy, once it has been implemented. If institutions of higher education and governments at all levels can reestablish some measure of mutual respect and trust, then the institutions should willingly provide policy-relevant and accurate information and the various levels of government should be able to deal with higher education more openly and gracefully.

I would urge all participants at all levels in the policymaking, reporting and monitoring processes to consider carefully the import of this comment by George Herman on CBS Radio as reported in the *Washington Post*:

> The knowledgeable connoisseur of the Washington language will want to take a very careful look at a recent Department of Justice release about counter-intelligence programs. Bad enough that such programs are called co-intel-pros. But even more astonishing, . . . one discovers with that rare thrill of discovery, that linguistic look of wild surmise, that federal agents sought to confuse target groups by various means . . . "to provide disinformation."
>
> Disinformation! A brand new coinage to be culled from this long dull release and lovingly preserved between the pages of a big dictionary in which it does not otherwise appear. At least not yet. . . .
>
> In time, not knowing about disinformation will surely be a grammatical disdemeanor. . . . It may not exist in the English language, but in Washingtonese, I predict a mistinctly brilliant future for it. There is no end to the malicious dischief and endless disconduct that may now spring up as a result of this marvellous distake. . . . It's a new world where disinformation is officially mispensed and the gullible are disled. (Dec. 3, 1974)

"Disinformation" has not been peculiar to a single federal agency, nor to governmental agencies. I am quite certain that many institutions have in the past engaged in the game of "disinformation" in dealing with federal agencies, with state legislatures, and, indeed, with internal constituencies. The present art of the state, in its dealings with higher education, may well be a reflection of the past artifice practiced by many of us in higher education.

The relationships between governments and institutions seem month by month to require almost geometrically increasing amounts of time—but much of the time, for both parties, is spent on bits and pieces, on details, rather than on substantive issues. The case, or cases, for our diverse systems of postsecondary education may flounder in a morass of unfocused and perhaps irrelevant data unless we are able to identify the significant policy issues at each level and the nature of the information needed for decision-making at each level. I believe that institutional research has an important contribution to make in this process.

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INSTITUTIONAL RESEARCH IN A POSTSECONDARY WORLD

Lyman Glenny, University of California-Berkeley

State government remains the chief source of funding for higher education, and nothing on the horizon would appear to change that observation for the future. The public senior institutions rely most heavily on the state for funds; the community colleges do so to a lesser but increasing extent; and the private institutions, although not heavily subsidized except for tax exemptions by the state in the past, seek more state largesse in the future. Concurrently, the state is confronted with serious policy issues relating to support of research, public services and adults, to falling enrollments in some public institutions, to the probable closure of some private liberal arts colleges and perhaps some public ones, to the continuing oversupply of doctoral graduates, to the competition of new forms and new institutions of education with the collegiate sector, and to a host of issues relating to finance in a period of high inflation and severe recession.

The well-being of many institutions and the very survival of some relies on the mutual accommodation of the particular college or university with the state government. In some states this relationship is that of a single institution dealing with governmental agencies. In other states the institution must first find its place within a system of colleges or university branches, and in many states these systems of institutions must relate to other systems through a statewide plan of the coordinating board. Whatever the particular arrangement in a state, the individual college or university—public or private—must take the initiative in defining its future mission and capabilities or some state agency is quite likely to do it. The private sector is included because as the privates increasingly receive public funds, directly through grants or indirectly through students, the institutions become public de facto and will be treated as such by state executive and legislative agencies. The whole history of state government supports this view.

With rare exceptions, institutional definitions of function and programs for the future will be reviewed, second-guessed, and modified by one or more agencies of the state in which it is located. The social and political environment for resolving institution/state issues is very complex and very different from the great expansion period of ten years ago. Institutional leaders and research staffs must comprehend these environmental complexities and gear their data bases, information systems, and planning efforts to this context if they are to have a substantial role in determining their own fates. Presidents in particular must be helped by institutional researchers to understand such external factors as demographic trends, vital statistics, student demands, and job-market trends, and such internal factors as I shall point out later in the paper.

As we shall observe, many presidents appear to be unaware of the vast changes taking place in the structure and power relationships among agencies dealing with higher educational matters, with the competitive challenges of new institutions and new modes of instruction, or with the form and content that institutional plans must have in order to adjust in a positive and aggressive way to the emerging new world of postsecondary education.

Perhaps the least understood part of this new world are the fundamental shifts in power relationships among state agencies as they relate to the planning and coordination of higher institutions. The social context for establishing new institutions or new roles for existing institutions in the 1960s was one of almost unbridled expansion and optimism. Enrollments, funds, and buildings all grew massively, and each senior institution, new or old, seemed to aspire toward status as a graduate research institution. Junior colleges proliferated to become community colleges and in some cases sought and succeeded in becoming senior colleges.

State governments responded to the growing complexity and problems of expansion by creating a variety of coordinating and planning boards or councils. These new agencies and the institutions operated in a political context of relative simplicity. Most governors' offices had small staffs and rarely a specialist for higher education. In state legislatures a political assistant might sometimes be found, but professional staffs were virtually nonexistent. Under these conditions, coordinating boards entered a near vacuum with their fresh staffs of professional specialists in planning, budgeting, and program development. These agencies were in an ideal position to create a favorable record of accomplishment, with both the governor and legislature relying increasingly on the coordinating board for planning and initiating policy. By the late 1960s most such agencies had completed one or more planning cycles, and the plans—almost without exception—anticipated unending increases in the number of young people and the proportion of high school graduates who would attend college.

Today, institutions and coordinating agencies face a very different political and operational environment (Glenny & Assoc., 1971). By 1970 the staffs of many governors' budget offices expanded to include professional specialists for higher education. These analysts, selected for their competence and experience, reviewed the budget and programming work of both the institutions and the statewide boards. The executive budget became the instrument which largely determined the allocation of funds among state services and among public institutions of higher education. As funding constrictions and unexpected enrollment drops occurred, coordinating staffs tended to move toward the increasingly powerful governor and away from the legislature.

Concurrently, many legislatures began to actively combat the continuing accretion of gubernatorial power. They, too, hired professional staff for research units and for the appropriations and finance committees. In the past four years the growth of these legislative staffs has been very great.

Specialized staffs equal to that of the governor are not uncommon. Economists, political scientists, accountants, and managers now aid legislators in dealing with the operating agencies of government. Moreover, more legislatures than governors have established new program review and performance audit agencies or added that function to an existing office. It is not uncommon for a public college and university budget request to be reviewed seriatim by the state coordinating board, the executive budget office, and from one to four different legislative committee staffs. Colleges and universities increasingly exhaust their planning and management resources in responding to the plethora of executive and legislative staff requests. Little time remains for educational program planning and development which legislators and governors want desperately, and which, if institutions are to survive in the next 20 years, must be done.

The environmental context is further complicated for institutions by federally-initiated programs for buildings, continuing education, instructional equipment, and student aid, along with the accompanying regulations for administration and those dealing with affirmative action for women and minorities. Rather than assign administration of these programs to existing coordinating or statewide governing boards, new agencies were often created by the states.

Primarily because of this proliferation of state agencies, the federal government sought to create a single comprehensive planning agency in each state by means of the Education Amendments of 1972. These so-called "1202 commissions" (identified by the number of the section in the law) were to involve all of postsecondary education in planning and in commission membership—public, private, proprietary, and vocational-technical institutions. A few states took advantage of this opportunity to unify the separate boards of the federal programs, while others awarded the 1202 functions to the existing coordinating board. However, some 15 states created still another new agency. The unfortunate result of these developments has been to increase the ambiguities for responsibility for state planning and operations. Institutions must deal with an array of state boards and commissions for segments and systems of higher education, as well as with expanding executive and legislative staffs.

Further, federal funding patterns emerging during the past five years award less money directly to institutions and more to students through grant and work-study programs. The federal policy of aiding students through the institution has led the government into an extremely complicated set of administrative arrangements with the colleges and universities, as it attempts to achieve federal objectives rather than the more parochial objectives of the institutions. Also, it is not clear whether state and institutional planners have considered the operational consequences of federal student-aid programs, much less recognized them as integral to the total financing of higher institutions. Yet if the continued thrust of federal funding is toward student aid, as appears destined, these programs require integration operationally with similar state-aid programs and with state financing and institutional planning.

These new complexities of the political and organizational environment for institutions require different data and information bases as well as new perspectives on the decision-making process. But probably more important for societal welfare and institutional survival is the resolution of the confrontation between the new forms, modes, and types of agencies for offering postsecondary education on the one hand, and the higher institutions both new and old facing drastically changing enrollments on the other. The optimization of resources for higher education is already impaired by the lack of knowledge of the scope and form of postsecondary education, and the lack of consensus on planning strategies—and even the need for planning.

The facts show that the recent downturns in enrollments can be attributed to a change in the percent of high school graduates who attend college. Census Bureau data show that, nationally, we have already returned to the college-going rate of 1962—about 50 percent of high school graduates and 34 percent of the age group of 18 to 21 year olds. Yet while the college attendance rates have gone down, the number of 18 to 21 year olds—the traditional college group—has increased by a million in the last three years. The number will increase by another million to about 16.8 million in 1980 and thereafter drop rapidly. By 1984 there will be only 15.6 million—the same as Fall 1973—and by 1991 the number should be only 13 million, the same as the mid-1960s (U.S. Census Bureau, 1972-73).

Thus the decline in college-going rates indicates the competitive reality of new institutional forms and means of offering education. Students turn from college to look elsewhere for education and for work. Dislocations in enrollment now affect very unevenly the various states and different types of institutions within a state. Some continue to gain enrollments, while others suffer substantial losses; and so it will be in the future, at least until 1993. Therefore, it is unwise to consider current dislocations as temporary.

Enrollment fluctuations among types of institutions is severe, but within institutions similar fluctuations take place among the disciplines, requiring a substantial redistribution of resources. The Census Bureau (1974) reports that in the six years from 1966 to 1972 the biological, health, and social sciences, together with business and commerce, increased from 30 to 38 percent. Conversely, engineering and the physical and earth sciences were down over 30 percent, and education by 10 percent. The data show that shifts within institutions may be even greater than these national averages, causing administrators and faculties grave problems in obtaining new professors for the expanding fields, while decreasing faculty (some tenured) in other fields—and perhaps accomplishing this feat within an institution which is steadily losing total enrollment and thus eroding its funding base. In a study of state general revenue appropriations for higher education, the Center at Berkeley found that only two-year colleges were keeping ahead of inflation in number of dollars appropriated per FTE student (Glenny & Kidder, 1973). That fact heavily influences the amount of flexibility and budget slack for public institutions to respond creatively to the new conditions.

The Center's state budgeting study also found that higher education has reached a new low in terms of priority among state services. This finding has been further confirmed by a survey of the ten western state budget directors which found that higher education had very low priority, well below elementary and secondary education.

Given this greatly changed climate of opinion and attitude toward higher education and the structural and political context within which it seeks support, what are institutions and coordinating agencies doing or intending to do for institutional welfare? At the state level, the Center studies show relatively little long-range planning taking place. Coordinating agencies and statewide boards are responding to immediate policy issues, on the establishment and location of institutional proposed medical and veterinary schools, and on specific suggestions for new doctoral and professional programs. But with few exceptions among the states, planners are not engaged in conceiving new initiatives in programming, in setting system goals, in reviewing or redefining institutional missions, or in establishing other parameters for the development of individual campuses within a system of public and private institutions. Certainly, few pay much attention to other postsecondary forms or agencies, much less take them specifically into account in planning.

We also find legislators and governors much concerned over the lack of direction and focus in higher education. I do not suggest utter chaos at the state level, but actions taken thus far fall far short of political expectations and, given the conditions and trends already known, short of requirements to meet the new realities. If state-level higher education agencies appear naive and incapable of grasping the significance of the changes for higher education in the postsecondary world, how do institutional leaders deal with the issues and the intensely competitive relationships arising from this context? The answer is very much like that of the state-level people. In a survey of 2500 college and university presidents conducted by the Center for the Carnegie Council for Policy Studies in Higher Education on how institutions were responding and planning to respond to leveling enrollments and funding patterns, we found some interesting, some unexpected, and some incongruous responses.

For example we found that 63% of the presidents had headcount enrollment increases of 10% or more in the past 5 years, and that 46% expect to have that much of an increase in the next 5 years. However, whereas 16½% had decreases of 10% or more in enrollment in the last 5 years, only 4½% expect that much decrease in the next 5 years. Similar findings depict the FTE enrollments. In the two years 1971 to 1973, about 32% of the presidents reported enrollment reductions of some magnitude; nevertheless they appear much more optimistic about the future, at least to 1980.

Our data also show shifts in expenditure in real dollars per FTE student. Only 6% of the presidents indicate a decrease of 10% or more in real dollars per FTE student in the past 5 years, and only 4% estimate that much reduction in the future. Our Center study on state general revenue shows only public community colleges well ahead of inflation in real dollars per FTE student. The large state universities have not kept up, and thus have fewer dollars per student, while state colleges and universities have just kept even with inflation. Private institutions obtain about 30 to 40% of their funds from sources which relate little to enrollment, and thus have kept up better in real dollar terms per student than have the public. Also, private institutions, especially the liberal arts colleges, often experienced enrollment reductions but not comparable losses of revenue; hence their real dollars per student increased. (Do the presidents have information from their institutional research offices on these subjects?)

Presidents expect relatively little change in funding patterns to 1980 compared to the recent past. Although fewer than in the past, 70% of all presidents still expect increases from state government. They are much less optimistic about the federal government. On the other hand, they are optimistic about private donations as opposed to government sources. Eighteen percent more than in 1974 expect increases from endowments, 10% more from foundations and corporations, and 12% more from other private donors. And 10% expect more income from continuing education and related services. Is there reason to believe that some, if not all, of these estimates for the future are overly optimistic for a large proportion of institutions in the nation? (Does your institution have the data to aid in retreating to a fall-back position if the estimates do not materialize? What kinds of data will be needed?)

As an aid in assessing trends for the types of students who would be recruited by institutions, we asked the presidents to indicate the extensiveness of their efforts to recruit among nine classes of students. As one might expect, the largest single percentage figure in either time period is toward recruitment of traditional students. But whereas only 5% more will recruit extensively for these, 28% more will do so for adults over age 22, 26% more for evening students, 22% more for off-campus students, 20% more for early admittees from high school, 19% more for transfer students, and 17% more for previous dropouts. Clearly, the emphasis is on the adult student and those attending at different times and in different places than the traditional on-campus student. Will your information base keep your president apprised of the shifts in these and other types of student enrollments? A majority of presidents expect to do extensive recruiting in most of these categories in the future. (Will you be able to tell your president how successful he has been each term or year?)

We also asked the presidents what number of new programs they expected to start for the new students they recruit. Our data indicate that 16% fewer than in the past expect to create new programs for ethnic minority students, but 18% more expect to do so for adults over 22, 14% more for evening students, and 13% more for off-campus students. Note that there were practically no decreases in any of these categories in the past, and few decreases are expected by 1980. For undergraduate and graduate levels, the presidents are far less optimistic about the number of new programs than in the past. Almost one-quarter fewer presidents estimate increases. On the other hand, 11 percent more presidents expect to increase the number of programs for extension, evening, and continuing education students. (Will your data bases allow monitoring of these expectations? What data would be helpful to the president in measuring his degree of success in achieving the objectives?)

Further, we asked the presidents for the increases and decreases they expected in enrollment in the various academic areas. Only in foreign languages, engineering, and education in the period 1968 to 1974 do more presidents report decreases than increases. In 1980, however, the presidents expect enrollments to be distributed in a somewhat different array than in the past. Far fewer presidents expect increases in the fine arts, social and biological sciences, or education than in the last five years. Only in engineering, business, and vocational areas are more increases expected than in the past. On the other hand, far fewer presidents expect the decreases in enrollment that characterized the past in almost all of these areas. They are much more optimistic about engineering, foreign languages, the physical sciences, and mathematics. The figure showing the largest increase in both time periods is "vocational and technical."

Data on the use of various teaching-learning modes show a slight reduction in lecture methods and fair increases in the self-study techniques: video and audio tapes, independent study, field work, and internships. (Will we have data to reveal the relative costs and effectiveness of these changes in teaching modes? What additional data will be required?)

The presidents' questionnaire also asked about the elimination or consolidation of courses and programs for purposes of reallocation of resources. Few presidents have extensively engaged in this activity and few expect to in the future.

However, by 1980 it appears that the majority of presidents will reduce certain undergraduate and graduate courses and programs, and that the percentage who will do "very little" drops to roughly half of that reported for 1968 to 1974. So presidents do see a need for more efficiency in the curriculum in the future. (Do our existing data sources seem adequate to provide a measure of this efficiency?)

The questionnaire also contained a number of items on faculties and staffs. It would appear that presidents expect fewer increases in all of our 8 categories, with 20 to 30% fewer expecting increases in tenured and nontenured faculty, administrators, and clerical staff in the future than in the last 5 years. Four percent fewer presidents estimate reductions in instructional staff by 1980 than in the recent past. They remain optimistic about maintaining the existing level of staff or of increasing it.

We also inquired about the rigor of standards for promotion, tenure, and merit increases for faculty, and found substantial increases in these standards in the last five years and an even greater percentage (about two-thirds) reporting increases by 1980. Also, efforts to evaluate the teaching competence of faculty will be on the increase in 82% of the institutions. Despite this increasing control over faculty welfare and activity, the presidents expect only modest increases in collective bargaining by faculty. Only one-third of the presidents report that faculty will probably be collective bargaining by 1980 as against the 13% in 1974. One wonders if the faculty will respond so demurely!

All of our data show that higher education was truly expansionist in the recent past and, while the percentage of presidents reporting further increases by 1980 is somewhat less on most items, a definite sense of optimism pervades their attitudes toward the future. Even those who have already suffered enrollment and funding losses estimate the future with sanguinity. The administrators also appear sufficiently satisfied with their recent tactics and strategies for recruiting new clientele, adopting new programs, and meeting staffing needs, to report no major changes in activities beyond those already underway in 1974. Adjustment, if any, will be more of the same. By doing the same they expect conditions to be better, and certainly no worse than at present.

Given the public and political attitudes about higher education and the great changes occurring in the types and kinds of institutions and agencies engaged in postsecondary education, the expectations of presidents often seem unrealistic. While it has been my impression that state planners and coordinators are perhaps more aware of these changed attitudes and conditions, they, like the presidents, also tend to stick with the status quo. So far, few have rocked the boat of complacency until a genuine crisis arises from real budget cuts by governors or a drastic drop in enrollment occurs.

The dictates of Governor Lucey of Wisconsin to the state university system are likely to come within the next few years to most state systems in the nation. On January 8, 1975, the governor directed:

> From: Patrick J. Lucey, Governor, State of Wisconsin
> To: Frank J. Pelisek, President, Board of Regents, University of Wisconsin System
>
> By April 15, 1975, I asked that the Board of Regents bring to my office and the legislature a plan for phasing out, phasing down, or consolidating institutions and programs, including a statement of language to be inserted into the 1975-77 biennial budget which would authorize implementation of the plan.

In Wisconsin this has meant a crash program to provide the plans demanded by April 15th, a mere three months to complete an extremely complex set of plans. Why did the Wisconsin governor offer his directive? Currently, other governors as well as legislators are asking ever more searching questions about the role of institutions of higher education.

Higher education is unquestionably very important to the state for improving the quality of life and the economic welfare of its citizens—an importance whiih will increase rather than decrease in the future. However, if the college-going rate is an indicator, what higher education has offered in the past probably meets the needs of only a minority of either youth or adults today. The new emphasis on postsecondary education reflects this fact. Industrial, military, and governmental training agencies, proprietary institutions and a host of churches, social organizations, and labor unions now extend opportunities highly underestimated in their number and omnipresence and underrated for their educational contributions to the citizenry. These are the institutions which predominately compose the postsecondary world. The Commission on Non-traditional Education (1973) reported that over 32 million persons engage in such education—far more than the 8 to 9 million degree enrollments in colleges and universities. The trends as currently perceived indicate that higher institutions will enroll an ever-diminishing proportion of the total pool of persons who seek education beyond the high school (Moces, 1970).

The changing institutional patterns for offering training and education are paralleled by an equally array of new means of delivery such as audio and video tape cassettes, closed and open circuit TV, and independent study. The potential of these means of delivery by agencies other than colleges has as yet hardly been tapped.

As we note from the responses of presidents to the Center questionnaire and other sources, higher institutions have made some aggressive moves to compete in this new environment. Colleges give credit for previous experience, for participation in social action, for a year abroad, and for other activities historically foreign to higher education. However, few of these build up campus enrollments or credit hours for budget-generating purposes.

As enrollments drop or level off, staffs of higher institutions seek new constituencies to serve—primarily adults from all walks of life as well as low-income students. Private colleges make contracts with industries for adult education and also engage in extension activities formerly the sole province of the large metropolitan private university. State colleges, badly affected by enrollment slippage, offered little extension work in the past but now do so through off-campus centers, late evening and weekend classes, and correspondence courses—much of which has recently been relabeled for residence credit.

The greatest uncertainty, given these new thrusts toward attracting the adult student, is knowledge of the exact size of the adult education pool. Some enrollment projections for higher (not postsecondary) education assume that adults will more than make up for any enrollment losses of young people. Other scholars, and this author, are not convinced that the rate of growth of adults in colleges and universities will be much larger than the increase in the overall population. Rather, the options made available to adults in other types of post secondary institutions will be those chosen. Nevertheless, many four-year institutions both public and private that have never catered previously to adult needs now actively recruit such students. A few will be successful, others will waste resources in the attempt to meet a market which does not materialize.

If adults are successfully recruited to make up for enrollment declines among young people in public institutions, the state faces an important policy issue. In the past most direct costs of extension and off-campus courses were paid by the student; now, by giving resident credit for such work, many state institutions bring these enrollments within state-funding formulas for regular daytime students. Few states have faced this issue directly, but the time has come for most states to decide on role responsibilities for financing adults.

More importantly, the new instructional forms and modes are not minor adjustments in education: They have revolutionary import and should be at the heart of institutional planning. Nisbet (1974) has called for reassessment of institutional missions and goals in the face of such change: He predicts that most colleges and universities will become more parochial, meeting local and regional interests and needs rather than national ones.

Governors and legislators are aware, sometimes seemingly more acutely than educators, that the climate and environment for postsecondary education is in a volatile state of flux. They want the state-level agencies and the institutions to take a more studied and aggressive stand on how and in what dimensions each campus will fit into the new spectrum of agencies and modes of education. What they really want is probably impossible to provide in absolute detail. But what they observe is that which is reported by the presidents, some tightening up on courses and programs and on number of faculty, but not much; and a great deal of laissez-faire thinking that the future will be little different from the past.

State pressures for better and more comprehensive long-range planning are undoubtedly going to come from the politicians and will be directed at the state coordinating and planning boards. Individual institutions will be caught in the intricate web of committees, task forces, and special teams which large-scale planning efforts at the state level entail. Very few presidents will have well-thought-out ideas about the future roles and functions that their institutions can perform optimally within the competitive postsecondary environment, and fewer still will have actual plans to achieve their objectives. Thus, most institutions and campuses will be vulnerable to the point of helplessness to ideas and designs imposed on them by outside forces and agencies.

An aggressive, realistic planning mode is the best defense against imposition from without of roles and programs for an individual institution. The stance requires new perspectives on the institutional role in the wide spectrum of postsecondary institutions and also new data bases for providing more meaningful assessments of internal operations and of faculty and student trends that bear on policy issues.

Fairly accurate current data with a ten-year historical base seem imperative in assessing an institutional position. Data bases need to be laid for determining: what types of students are distributed among courses and programs; whether new and adult students fit successfully into existing curricula; the types of student who drop out in comparison with the past; the reasons for dropping out and where the students go; how age, training, and tenure of faculty members affect program change, and student attendance and persistence; the societal performance of students after graduation or certification; the relationship of program to student self-development, social adaptation, and career success; student entry, admission and graduation rates; internal procedures for admission, transfer, and graduation; and the responsiveness, durability, and success of curricular innovations as they relate to the several types of students. These data and many more pieces of information must be analyzed on a continuous basis.

Policy and planning purposes require assessment from any new or expanded data sources, with the results provided in a format which is easily and quickly understood by the policymakers on campus and off. Elaborate costing studies can be much more easily boiled down by using Warren Gulko's Cost Information and Reporting System than by the more elaborate and detailed reports produced by NCHEMS or CAMPUS models. Models for management of faculty such as that developed by Hopkins at Stanford, and those of Balderston on internal resource control, are not elaborate or complicated but can effectively comprehend an extremely complex set of variables and yet be quickly grasped by college administrators.

Too, institutional research staffs and policy analysis groups can contribute substantially to the well-being of an institution by aggressively pursuing with state agencies objectives and goals backed by data-based realism and imaginative analysis. State plans can then support strong institutional plans rather than initiate models and procedures for imposing state-conceived priorities. An institutional planning vacuum invites state intervention and domination, whether through a state plan or ad hoc decisions. A well-thought-out plan based on realistic assessment of an institution's strengths and potential invites state support and cooperation rather than control. At a minimum, an institution ought to know more about its students, faculty, programs, operations, and plans than the state agencies—a condition often unverified by current research.

The future is not bleak for institutions and staffs that recognize the trends and take appropriate actions to either change a trend or to respond to its demands in meaningful ways. But analyses, plans, and action must be bywords if success is to be assured.

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THE TRANSACTIONAL FRAME OF INFORMATION

William M. Sibley, The University of Manitoba

A few years ago two *graffiti* appeared on the walls of the New York subway. Some one first wrote: "God is the answer." Below it some one later scrawled: "What is the question?"

I think that in certain ways this sequence parallels the recent history of the development of modern information systems. What ever the *question* might be, we believed that "information" was the *answer*. In this belief we were not mistaken. But how far our elaborate and sophisticated panoply of "information systems" is yielding us the *kind* of "information" currently required and whether we can be confident that our systems are being put to proper use are issues now demanding attention.

Although I have personally been involved in the development and use of an information system, I by no means claim to be an expert in the technology of the subject. As a university dean, planner, and vice-president, I have dipped my toe in such systems; have several times been in them up to my neck; and on more than one occasion have nearly drowned under the flood of information now being spewed out. What concerns me today is not the *technical* side of the subject; rather, I want to talk about an emerging series of problems, having to do with the nature and functioning of our contemporary information systems in the present context—a context radically different from that in which, a few years ago, they were born.

I shall come presently to a listing and an analysis of these problems. Before doing so, however, let me state my central theme: namely, that these problems arise in the context of what we might call "the human side of information." Much too naively, we have tended to assume that information is a "thing-in-itself," something we can "gather," "store," "deliver," even "give" to someone. In fact, it is no such thing; it is a relational concept of very considerable functional complexity. The acquisition, use and transmission of information, for example, are not processes divorcible from the real (as opposed to the apparent) decision-making process of a given institution, nor from its goals and objectives. Nor are they divorcible from the real (as opposed to the apparent) communication system of the institution. If information systems are not being quite as "informative" and useful as we had hoped they might be, the causes are to be traced to certain changes in those highly complex *transactions* between and amongst human beings which are presupposed in the very construction as well as the use (or misuse) of an information system. The whole "transactional frame" of human relationships has been undergoing drastic changes, changes which call for our attention and reflection. My remarks, then, will be directed to an analysis of *the transactional frame of an information system*.

Some Emerging Problems

As John Dewey pointed out, we normally engage in reflective inquiry only when something puts a stop to successful action. Why has the topic of "information" appeared on the agenda of this conference, in conjunction (and appropriately so) with the other two topics—decision-making and the goals of postsecondary education? Do we really need information about information—which surely is our stock in trade? But if not, why are we here? For my part, I think there are indeed questions to which answers, or responses, are needed; and I shall list a few issues about which I consider some reflective inquiry is relevant and necessary. I select four only, from a potentially much larger list.

(1) In the first place, there is the problem of the "scarcity of attentional resources" amongst the "managers" of an institution or organization, for whom (as we say) we are "gathering information";

(2) Secondly, there is the problem of communication of information;

(3) Thirdly, there is the impact of new decision structures and styles on the development and use of an information system;

(4) Fourthly, there is the impact of new kinds of relationships within an institution (or between an institution and the external world) upon the development and use of an information system.

The Scarcity of Attentional Resources

As Herbert Simon (1973) has recently pointed out, many of the efforts to design information systems "took over, implicitly, the assumptions of a past society where information rather than attention was the scarce resource" (p. 271). Nowadays the situation is reversed. We are (as we say) *flooded* with information: hence it is not accidental that, a few moments ago, I spoke of "being drowned" in it. (As one of my colleagues has put it, we wanted a fountain of knowledge, not a fire hydrant! Or one is reminded of the story of the Sorcerer's Apprentice—who learned how to turn on a supply of water but not how to stop it.) There is a sense in which far more "information," or at least *data*, is being produced than can be intelligently used by senior management. The "attentional resource time" of senior management, as Simon notes, is a scarce commodity—and becoming scarcer as, in this period of retrenchment and disorder, other problems become intensified and magnified.

The net consequence is that there are always facts "in the system," often vital, which do not float to the top and attract the attention of senior executives because the pressing problem at the top is not perceived, or is definitely misperceived, by those lower down. Nothing is more striking, for example, than this facet of the Cuban missile crisis, as analyzed by Allison (1971) in his *Essence of Decision*: namely, that many of the facts President Kennedy needed to know were "in the system" but failed to reach him because no one saw their significance.

Premier Khruschev was in like case. No doubt everyone can provide his own local example of this problem, which, I believe, will get increasingly severe as, in our large and complex institutions, financial pinch turns to financial crunch and genuine crisis develops. We speak of "the information explosion;" we forget that there is a parallel consequence, "the ignorance explosion." We say that you can't afford to be ignorant; but equally, there is a sense in which you can't afford *not* to be ignorant. (Try to know everything, and you will be swamped.) As Simon (1973) remarks, our information systems are going to need some better alignment with the realities of the decision-making process than is currently the case.

The Communication of Information

If your experience is like mine, you will have found that there are great barriers to *communication* within the institution of the information we do have. We speak a technical language which actually repels many of those with whom we are trying to communicate. Where a language is not understood, its use arouses positive suspicion. (When two strangers switch language in your presence, do you not suspect they are speaking adversely about you?) Many will not take the trouble to learn our language; to learn *any* language, you must have some faith that what you are being asked to learn is of value and significance to you. As the Quakers say, there are times when I must "speak to your condition." But if I cannot even communicate with you, because of some language barrier, I certainly cannot be *informing* you—not, of course, just in the sense of "telling you," but in the sense of helping you to become more knowledgeable and insightful. In past times, when the work of information systems personnel did not impinge very greatly on our colleagues, the attitude to us was one of indifference or tolerance. Its impact is now increasing; and as they become aware of this change, they may well become positively hostile toward us.

New Decision Structures—and Their Impact

My remarks thus far seem to be in part contradictory. On the one hand, I have noted that we have in our possession plenty of facts which never get used; on the other, I have just been speaking of an increasing (and increasingly sensed) impact of information systems. The contradiction is resolved if we stop to consider that old decision structures and styles are rapidly being eroded and new ones taking their place. During the decade of the 1960s most of our institutions moved away from older and much simpler systems of decision-making, which might be characterized as belonging to an "age of authority," in the direction of much more "participatory" modes. Whatever gains may thereby have been achieved, it is undeniable that the process of decision-making increased in complexity by several orders of magnitude. The result is that we are nowadays confronted with a bewilderingly intricate system—if it can still be called a "system"—of decision-making. Within a large and highly differentiated university, the task of getting *any* decision out of the system grows more and more onerous—and especially so as with the disappearance of slack or reserves within the system, easy solutions placating all factions are no longer possible.[1]

First, the *formal* system of decision-making within many institutions becoming much more complex and unmanageable; conversely, the *real* loci of decision-making are being shifted. For instance, the real (as opposed to the nominal or formal) powers of presidents and boards of trustees have become severely attenuated, as colleges and universities have steadily been losing their old autonomy. Secondly, some of the new loci of decision-making are *hidden*. Here we encounter the phenomenon noted by Glenny (in his 1971 address to the Association for Institutional Research) of the "anonymous leaders" of higher education: some unidentifiable bureaucrat hidden in the bowels of some branch of the civil service or of your state-wide coordinating board may be having a most profound influence on what will happen to your institution by the way in which he filters, and perhaps greatly distorts, the information flow as it passes his desk. His objectives, or those of the persons for whom he works, may in fact be quite different (and frequently are) from those of the governing board of your institution. They may also, of course, be in conflict with the professed or real objectives of other governmental agencies, local or national. Precisely for whom, one wonders, are we really "gathering information"?

The fact is (at least with respect to large, complex, "multiversities") that we can no longer talk in simplistic fashion about "the managers" of the institution. Yet we cannot talk sensibly about a "management information system" without knowing who are "the managers", i.e., the influential decision-makers. The difficulty is that there are now just too many of them—and with diverse, incoherent, and even conflicting objectives. There is no point in talking, in abstract terms, about "objectives." *Whose* objectives?" is always the central question to be pressed. If I am not mistaken, information system personnel are going to become somewhat mangled in this jungle of incoherent, conflicting and, what is worse, *hidden* objectives. One and the same set of facts (e.g., the low cost of undergraduate credit hours in your Faculty of Arts) may help you make an argument for "efficiency," and strengthen your case for funding with your government; the same set of data, if published, may enrage the Arts professors *within* your university. Examples of a like kind are easily multiplied.

New Transactional Relationships—and Their Impact

Not only has there been the impact upon our institutions of higher learning of new decision styles and structures, overt or hidden; of equal or greater significance is the impact of new kinds of relationships governing the transactions between and amongst the members of an institution. "Participatory" decision-making structures were hardly in place when the current period of "storm and stress" hit us. Over the last few years, we have been encountering a whole series of shocks to our systems. In many institutions, enrollment began to decline, either absolutely or relatively. Even where it was held relatively steady overall, there have frequently been internal shifts which can produce most serious difficulties with respect to resource allocation. In many jurisdictions the acquisition of essential funding has become much more difficult, as a mood of disenchantment with higher education has taken hold of the public and of legislative bodies. As growth ceases or diminishes, as financial structures fail to cope with the problems of an era which they never were at all well designed in the first place to meet, dissatisfaction and insecurity amongst staff mount to the point where former mechanisms of conflict resolution start to break down. The entire transactional frame of relationships undergoes alteration to the point where we may be looking not at a system *change* but at a system *break*.

Consider, for example, the increasing role of collective bargaining, especially academic collective bargaining, on the campus. Even where such bargaining is not *formally* present, the lively possibility of its advent is having a marked effect. The "collegial" style of governance now co-exists in uneasy juxtaposition with the "adversarial" mode formally inherent in the structure of collective bargaining. In this new context, information systems are bound to become objects first of study and then of dispute. Access to information is demanded: is not information power? Getting "an agreed statement of facts," however, in an adversarial situation is frequently as difficult as settling the dispute itself. Values are presupposed in the very way in which we "appreciate" or assess or see a situation, as well as in our stance regarding what should be done. In every "fact," except perhaps the most elementary, there is usually some element of theory or interpretation. When we report as a "fact" that the cost of a credit hour in a given faculty is $50, we are in reality building in opinions, "judgment calls," and values. (It has been well said that prices are facts, but costs are opinions.) To the degree to which collegial attitudes weaken, and the valence bonds holding an institution together dissolve, trust and faith diminish also. Not only the use but the very *foundations* of our information systems will then come under scrutiny and attack. The attitude of suspicion and hostility of which I spoke earlier will become more marked. As we all know, some modes of counting staff and students may be a matter of indifference: others will vitally affect the internal distribution of resources. Sensing the significance of our work, faculty *may* come to see the necessity of learning our language. Instead of its then being used as a mode of communication, however, for the better achievement of common purposes, it may well be used in a destructive or blocking mode. *Which* "facts" are to count? Those which are important, no doubt. But important *to whom?* As collegiality and community weaken, such problems will tend to become more serious.

We may put the matter as follows: rather carelessly, we have become habituated to thinking of "information" as just neutral "input" into a decision-making process. But "information" is itself "output." In future, questions will be pushed and argument will ensue over such issues as: Just what was the input into your information system? What values, whose values, and whose "judgment calls" does it presuppose? As battle lines are drawn and divisions hardened, the role of the information system is bound to become increasingly difficult. In proportion as decision-making structures and power relationships change, and the context in which we operate becomes much more "politicized," nothing can remain the same—including our information systems.

Other changes are going to occur. One dominant characteristic of our contemporary information systems is their emphasis upon the readily quantifiable, and the establishing of systematic, logical or mathematical relationships amongst the quantified components. All of this work has been of the greatest value, if for no other than heuristic reasons: we learn all kinds of things about our institutions (often about its organizational faults), which otherwise we would never have discovered. Insofar as the information is actually used to make significant and desirable changes *within* an institution, e.g., for shifts in resource allocations, it clearly has a second kind of value. Thirdly, it has a most necessary *defensive* value, if (as is usually the case) your college or university must meet inquiries from funding agencies who, if necessary, will make their own judgments of comparability without your input, should you have none ready. What I want to add, however, is that as decision structures and styles change and as new relationships between participants come into being, new *kinds* of information of a non-logical, non-mathematical type will be demanded.

For example, if you have ever been involved in a bitter tenure dispute, the kind of "information" at stake can hardly be quantified at all. It is much more a matter of who said what, at what precise time, in what context, under what policies and rules, with what motives and what degree of objectivity, and so forth. As a second example, take all of the problems arising out of the "opening" of "personal files" on staff and students. All of the issues arising at this point have to do with "information" in some sense of the word, but of a type not contained in what we would typically call "an information system." Frequently the information your president desperately needs is about the *external* world: What really is behind the latest governmental move? Or he needs information about the political state of the university: Will Professor Gadfly be at that critical Senate meeting tomorrow? and if so, with whom has he been in caucus and how will he and they vote?

Let me bring these issues into focus by raising this question (about an imaginary place we shall call Puddlebury University): What is it for me to be well-informed about Puddlebury University? What operational tests would you, as information experts, resident in Puddlebury, put me through to determine the answer? Certainly, I would have to know and grasp the multiplicity of quantitative facts, and their interrelationships, as provided by your information system. But depending on the circumstances I might need to know a great deal more—about the traditions, customs, and ethos of Puddlebury; about its history; about its people, not as abstract numbers, but as individuals; about the real, not the paper, structure and organization; and so on. I might need to know all of this, almost as a citizen of Puddlebury would—from the inside, so to speak. And the reason I might (would) want to know all these things is that if I did not, I might have no insights or advice to give about the real and current *problems* of Puddlebury University. To be well-informed, I suggest, is to understand in such a way as to be able to advise on a course of action. "Information" is not a thing-in-itself, not an absolute; it is context-bound, and the context always includes reference to the question: *What are we to do?* If we do not grasp something of the import of this question, and the likely consequences of available options, we do not know what the criteria of a useful answer would be. In that case, though we may be walking encyclopedias of "facts" or "data," we do not have *insight,* and in that sense cannot be truly well-informed.

The Cone of Resolution

In order to convey what has been happening, let me ask you to form an image, which I shall call "the cone of resolution."[2] Imagine you are at the apex of a cone, several thousand feet over Puddlebury. You are the president; Puddlebury is still small and simple in its structure; and you have been a lifelong citizen of the institution. You can "take in" all of Puddlebury from this high vantage point. But you can also descend to the middle of the cone, where more resolution of detail is possible. Still further: you can get down to ground level; you know every net square foot of Puddlebury, what is happening in every laboratory and classroom, and, what is most important, you know every staff member, and indeed, most of the students, as *persons.* As the influential decision-maker, you *do* have an "information system." To be sure, it is not of the modern type; nonetheless it has a unity and coherence of its own, and these are the hallmarks of a *system.*

Now suppose that Puddlebury grows enormously. New disciplines and sub-disciplines appear, of which (quite frankly) you, though president, know nothing. The institution, besides growing in scale beyond anyone's comprehension, simultaneously becomes more complex. No longer can you get down to ground level: you are being forced upwards, steadily upwards, toward the top of the cone. You become more and more dependent upon those below you to supply the significant and vital details you need to know. You become increasingly remote from them; either they do not understand your problems at all, and hence sit on facts you need to know, or they may totally misperceive your problems, and send up silly or trivial data—by the ton.

For a time, however, all is reasonably well. Enrollments and revenues continue to climb. You are still in an era of growth, and with rising revenues you manage to contain conflicts among all of the contending factions. You have developed a good information system, which helps you to argue your case for funding before your government or state-wide board. It is a rational, logical system; its findings are "open"; and decisions at Puddlebury are now being made in a much more participatory mode, instead of the personalized mode of bygone days. As complexity increases, however; as financial conditions steadily worsen; as new factions emerge; as the whole climate gets politicized; as the numbers of real decision-makers (some hidden) multiply, you are forced upwards again, right to the top of the cone. But the top of the cone is a *point*—it is (in mathematical language) the *degenerate case.* Puddlebury University is becoming more and more blurred from your view, obscured by the dust and smoke of the battles now taking place below. While still important, the information system you built in the 1960s no longer embraces many of the vital things you need to know in your present predicament. To the degree that, more and more, you need information of a political kind, what is required is an information system with a different data base. The conditions of your being well-informed are being altered.

In brief: our modes of university governance, our decision-making styles and structures, and our "information systems," all change together. The highly rational, logical, systematic type of information system which we have all been engaged in developing emerged in a context which is now passing away. The transactional frame in which we have developed our contemporary information systems was embedded in a context which is now vanishing, as decision-making is altered and as adversarial relationships displace, or threaten to displace, old collegial relationships. The old valence bonds, which kept intact the nation, our political institutions, and our academic institutions, are being eroded and disrupted. We are entering or living in a new era; and in this new set of transactional relationships, those of us who are engaged in "information systems" work cannot hope to remain neutral and unscathed.

The Elements of a Transactional Analysis

If I am at all right in my contention that, in one important sense of the term, "information" is not a "thing-in-itself," but is a relational concept, and hence context-bound and action-oriented; and that the passage from being ignorant to being well-informed depends upon a complex set of relationships and transactions amongst human beings; then, if we are to understand what is happening, and how we may be affected, we need to take note of a whole network of transactions underlying communication and therefore the transmission of information. We need to understand all that is occurring when we unpack the following sorts of questions:

Who is speaking: *What* is he saying? *How* is his message shaped (i.e., by what rules and purposes)? *To whom* is he speaking? *Through what channels* or communication modes? *To what effect?*

Take the first question. Unless you as the speaker have genuine *credibility*, the process of making me informed cannot even get started. If I cannot believe *in* you, I cannot believe what you say, and you can never succeed in truly informing me—even though everything you are saying may be true. Secondly, I must at least understand your message. You have the obligation to make it clear, and I have an obligation to try to learn the language in which you are speaking. Such an effort requires belief on my part that what you are saying is of relevance and significance to me. Thirdly, what rules and what purposes shape your message? If I suspect that the rules and values which dictate your "judgment calls" and influence your analysis are not what they seem to be, and indeed may be such as to injure me, then confidence, communication, and information transfer will all be vitally affected. (The next time you want genuine information from me, especially of the "soft" kind, you are going to meet a lot of drag or resistance.)

To whom are you speaking? Probably to a multiplicity of target audiences—within and without your institution. Here you are trapped; but your only recourse (and admittedly this can be very difficult) is to be as candid as you can be about *whose* rules and values you are operating on in doing your work. Next, through what channels or modes are you speaking? Sender and receiver will each have his own cognitive maps and cognitive filters, which are bound to distort the message. And despite your best efforts, there will be plenty of "noise" jamming the signal, especially in times of crisis, tension, and dispute. The mode of communication can be important. For instance, if I have learned one simple thing about communication, it is that good news can safely be put in a letter: bad news should always be given face-to-face. Finally, what effect you have will depend on a host of factors outside your control. In the situation now facing us, the one essential thing that we must try to do is to retain at all costs our credibility. As everything gets more politicized, and as factionalism increases, this task is going to be far from easy. Perhaps as institutional researchers we cannot retain our hoped-for role as dispassionate neutrals. Perhaps we are going to be drawn more and more right into the thick of the battle.

Conclusion

If I have one anxiety as I conclude, it is that I might be misunderstood on one cardinal point. Let me reiterate that I believe very strongly in the positive values inherent in the development and improvement of contemporary information systems. I am not for a moment suggesting we abandon them—though occasionally I do wonder whether we have created an informational fat man who needs to go on a severely restricted diet. Rather, I have been trying to make more clear to myself (and I hope in some measure to you) the new kinds of difficulties we are encountering, and the central reason for these difficulties: namely, that "information" rests on "communication," and that both are being radically affected by the altered context in which we are living. We ignore that new context at our peril. We must not blind ourselves to these changes and their significance for us—both as professionals and as individuals.

If to any modest and useful degree I have been "speaking to your condition," I am well content.

FRAME OF INFORMATION

[1] For an illuminating analysis, see Chapter 5 of *Leadership and Ambiguity*, by M. D. Cohen and J. G. March, Carnegie Foundation for the Advancement of Teaching. McGraw-Hill, 1974.

[2] For this image (and several related points) I am indebted to Professor J. T. Stevenson of the Department of Philosophy in the University of Toronto.

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INFORMATION USEFUL FOR ACADEMIC DEPARTMENT PLANNING AND MANAGEMENT

Glenn K. Miyataki and Robert G. Gray,
National Center for Higher Education
Management Systems

Academic "departments" (sometimes synonymous with school, college, or division) are the basic organizational units within which the educational programs of an institution are executed, where critical resources are assigned and utilized, and where the administrators of these units are faced with handling the multiplicity of demands of faculty, students, institutional administrators, the legislature, and donors (Dressel, Johnson, & Marcus, 1970; Brann, 1972). The current educational environment of constraining budgets, reallocation of existing resources, shifting student demand, and increased faculty interest in the planning process demand that academic department administrators exercise ample skill in organizing and using information for planning and managing their resources and activities.[1]

During the 1950s and 1960s, it was generally possible to honor most funding requests. Today, however, academic department administrators are placed in situations where difficult choices must be made and relative values placed on alternative uses of resources (Hoenack, Meagher, Weiler, & Zillgitt, 1974). More academic department administrators are beginning to recognize the need to investigate the variety of planning and management options available to their organizational unit. They are finding out that they need to be able to articulate their situation more clearly, justify their resource utilization more objectively, and describe their role within the overall management of the institution more definitively. Thus, in order to promote a more effective operation of the institution, academic departments must be provided with the means through which they can plan and manage their resources efficiently.

The purpose of this paper is to discuss an approach that can be used by department administrators to facilitate their planning and management tasks through self-analysis or internal management of their unit. The approach focuses on identifying and examining information about the functions, demands, resources, and outcomes of an academic department[2] (Miyataki & Gray, 1975). It has been said that information is the "lifeblood" of planning and management and is essential to decision-making (Emery, 1969). Especially for planning and management, information can serve as a resource to reduce the uncertainty imposed by the current environment by attempting to clarify the choices (or lack of choices) available to the decision-maker. Information can also facilitate intercommunication among the various organizational units and academic departments within the institution.

From an information-based approach, a greater understanding can be reached regarding the type and level of decisions that must be made by academic departments (Featherstone, 1972), those that must be made or influenced by other levels of administration, and those that can be made jointly by the department and other levels of administration.

This paper discusses: (a) a perspective that can be employed to assist in identifying information needs of a department; (b) categories of information needed to support the planning and management process; (c) technological and organizational implications associated with obtaining and using the information; and (d) areas for future institutional research.

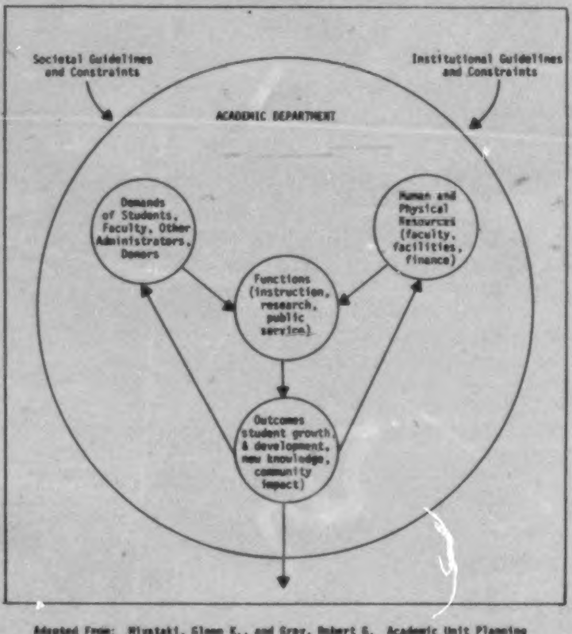
A Perspective for Academic Department Planning and Management

The operation of a typical academic department is illustrated in Figure 1. This particular perspective indicates that a viable way to view the academic department is through the various functions, demands, resources, and outcomes that are produced by its operation. In addition, the figure shows that societal and institutional guidelines and constraints must also be considered. The figure emphasizes that one way to improve decision-making is through a better understanding of these factors and how they relate to each other.

Underlying the operation of the academic department are the various concerns and tasks to be accomplished by the

Figure 1

ACADEMIC DEPARTMENT PLANNING AND MANAGEMENT PROCESS


Societal Guidelines and Constraints
Institutional Guidelines and Constraints
ACADEMIC DEPARTMENT
Demands of Students, Faculty, Other Administrators, Donors
Human and Physical Resources (faculty, facilities, finance)
Functions (instruction, research, public service)
Outcomes (student growth & development, new knowledge, community impact)

Adapted From: Miyataki, Glenn K., and Gray, Robert G. Academic Unit Planning Manual. Boulder, Colorado: Western Interstate Commission for Higher Education, 1975.

administrator. Although administrative styles and organizational structures vary among departments, many common planning and management concerns can be identified. For example, degree program requirements, student enrollments, size of budget, faculty availability, institutional and academic policies, educational innovations and objectives can influence the administrator's planning of the type and level of specific activities to be conducted by the department.

Along with the identification of the department's activities, the administrator has the major task of determining the availability, assignment, and utilization of human, physical, and financial resources. For example, the assignments of faculty must be planned in a manner that will best accomplish the various functions and activities of the unit. Another crucial task is for the administrator to assess the outcomes produced by the unit and the extent to which the demands of donors, students, faculty, and the institution are being met. Finally, the administrator must formulate the various planning requirements into plans and budgets that will serve as the bases for negotiation, communication, and submission to the institutional office.

Thus, Figure 1 pictures the department's functions and activities as the heart of its operations and provides a basis for identifying the key tasks of the department administrator.

Information Needs, Unit of Focus, and Procedures

From the academic department planning and management process, information needs can be identified. To support the use of information, however, the information must be organized and associated with an entity or a *unit of focus. Procedures* that would delineate how the information can be obtained, assessed, and utilized are also needed.

The first step in the planning and management of the academic department is to sort out and gain an understanding of the full array of functions to be performed by the unit (Dressel, *et al.*, 1970). While many of the functions of a department are in response to student needs (courses, thesis advising, student counseling), some are in response to commitments to external funders (research), some are in response to institutional commitments (committee work, public appearances), and still others are in response to department operating procedures (academic advising, faculty recruitment, personnel development). These functions can be referred to as the units of focus.[3]

Once the unit of focus has been identified, it is possible to identify *categories of information* that will describe or tell something about each function: the kinds and amount of resources to be utilized; whom the activities are to serve; what the planned levels of operation are; what funds will be expended; and what outcomes are planned. The description of a single or aggregate group of functions will help the administrator to make more informed decisions and judgments about alternative resource allocations.

The categories of information that the authors have found to be useful to a department administrator are:

Information About Demands identifies the teaching load or the levels of activity that are required to conduct each of the department's functions and includes expected student enrollments, faculty research requirements, and expectations of donors.

Information About Resources describes the faculty, staff, facilities, equipment, supplies, and services required to carry out the operations of the department, that is, how much of the existing and obtainable stock of resources will be consumed by the planned operations?

Information About Activities expresses the levels and types of operations and technology to be carried on within a unit of focus. For example, a teaching function can be conducted by lecture, seminar, or independent study and through classroom work, closed-circuit TV, or on-the-job training.

Information About Finances expresses in dollar amounts the sources of funds and expenditures for physical and human resources to be spent at a specific level of operation over various planning horizons.

Information About Outcomes identifies and describes the outcomes or products desired or achieved. These information items also enable the administrator to evaluate the degree to which the outcomes met the objectives of the function.

The use of the unit of focus concept in conjunction with the categories of information enables planning and management to be done systematically as a complement to the use of intuition, tradition, or hunches in decision-making. Moreover, information can be better understood and communicated (and therefore of more potential use) to other interested parties now that it is organized in a coherent and consistent fashion. Figure 2 depicts the relationship between a particular unit of focus (i.e., the various functions) and some examples of the various categories of information.

In addition to identifying the informational needs, the department administrator must consider how the information is to be obtained and used. Whether technical or nontechnical, manually-operated or computerized, procedures are needed to help department administrators obtain, assess, and utilize information for meeting specific planning and management tasks. During the early 1970s, the development of tools or procedures to be used by academic departments has increased. Some of these tools include a model by Andrew and Collins (1971) that matches faculty to courses; a simulation model, the Academic Department Game (Virginia Polytechnic Institute, 1973) that simulates a department's planning process by considering faculty interests, past performance, and department productivity ratios; and Integrated Optimization/Information System (Dyer & Mulvey, 1974) that is being used at the UCLA Graduate School of Management for planning faculty assignments; a Department Planning Tool (Hoenack, et *al.*, 1974) that can be used for investigating alternative allocations of faculty resources to meet student course demands; and the *Academic Unit Planning Manual* (Miyataki & Gray, 1975) that presents in detail a comprehensive, information-based approach to department planning and management. By using procedures or tools of this nature, the administrator can obtain the information needed to examine the internal operations of the department and thus carry out the required planning and management tasks.

Some Technological and Organizational Implications Regarding Planning and Management Information Use

There are several major implications that may influence the acquisition and use of information to improve department planning and management. One implication is concerned with the use of procedures or technological tools in practical departmental settings. While many of the advanced procedures or tools may have high potential value, there is little evidence to date of their use, their application to a wide variety of uses, or of their benefits to the overall institutional operation.

Therefore, it appears that any department administrator attempting to apply procedures to obtain and use information must consider the following: (a) Do the perceived benefits of using a procedure outweigh the expected costs of the information to be obtained? (b) What levels of comprehension are required to operate the procedure? (c) Which tactical strategy will be most effective in implementing the procedure? Unless these questions are addressed, the potential usefulness of information obtained may not be fully realized.

A second major implication involves organizational considerations. First, there is a need to clarify and improve the communication between the various levels within the institution with respect to department planning. Until the different levels understand each others' role in the planning process, department administrators in particular will be hesitant to do more planning due to the lack of clarity regarding the alternative resource allocations that will be sanctioned. Second, the nature of the incentives and disincentives that are currently operating must be understood and, in some cases, clarified and altered. Some department administrators, particularly in public institutions, now seem to regard resource allocation as primarily a political process, obviously affecting their willingness to obtain and use planning information since they can see minimal concrete rewards for identifying viable alternatives. In addition, information made explicit and thus available for the scrutiny of others may result in disincentives for those that obtain the information—threat of control, standardization, fears of revealing inequities, and information overkill.

Finally, an information-based approach may pressure the behavior of the administrator. Argyris (1971), in studying the implications of management information systems on management, has identified several conditions which seem applicable to department administrators: (a) reduction of space of free movement, (b) leadership by competence instead of formal power, and (c) decreased feelings of essentiality.

Reduction of space of free movement occurs when

Figure 2

A UNIT OF FOCUS AND ITS ASSOCIATED INFORMATION

(Unit of Focus)	CATEGORIES OF INFORMATION							
Academic Unit Function	Demand Information	Resource Information		Activity Information		Financial Information		Outcomes Information
		Availability	Allocation	Type	Level	Source	Amount	
History 100	300 Fr.	Faculty: 2 Full Prof. 4 Assoc. Prof. 6 Asst. Prof. 5 TA's	Faculty: 1 Full Prof. 3 Assoc. Prof. 2 Asst. Prof.	Lecture	6 Sec.	Account X	$10,000	% Completers Student Evaluation of Instructor
			Faculty: 3 Assoc. Prof. 4 Asst. Prof. 5 TA's	Recitation	12 Sec.	Account X and Y	$15,000	% Attendance Student Evaluation of Instructor
		Facility: Rooms 305, 306, 308, 312, 314, 322	Facility: Rooms 305, 308, 312, 322	Classroom Use: 305, 308, 312, 322	MWF, 9:10 MWF, 9:10 MWF, 11:10, 12:10 TTh, 8:10, 9:10, 2:10	-	-	-
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
History Graduate Program	10 Masters Students	Faculty: 1 Full Prof. 2 Assoc. Prof. 3 Asst Prof.	Faculty: 1 Full Prof. 2 Assoc. Prof. 2 Asst. Prof.	Courses: Hist 600 Hist 625 Hist 715 Hist 799 Hist 800	 1 Sec. 1 Sec. 1 Sec. Input. Study Thesis	Account B Salaries Travel Supplies Services	 $50,000 2,000 1,000 1,000	% Students Completing Program in 2 Years, 3 Years, Etc.; % Completers Obtaining Jobs in 6 Months
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮

Adapted From: Miyataki, Glenn K., and Gray, Robert G. *Academic Unit Planning Manual.* Boulder, Colorado: Western Interstate Commission for Higher Education, 1975.

management skilled in management information techniques begin to investigate behavior, policies, practices, and norms that have been operating covertly within the department. As these become explicit, those being observed may feel hemmed-in as management is now in a position to control their behavior by specifying minimum requirements. The results can lead to increased feelings of helplessness and a tendency to become too dependent upon those who created the restrictions.

Leadership by competence instead of formal power arises because of the need to be technically competent and cognizant of the uses of valid information. The consideration here is that valid information and technical competence become the new currency for power where a systematic approach to department planning and management exists.

Decreasing feelings of essentiality emerge when an information-based capability reaches a point of sophistication that requires less need for ambiguity and self-fulfilling prophecies; there will be less need for the use of influence in managing activities for now activities will be implemented in a planned and rational way. In addition, the protection against incompetence is reduced as ambiguity and fluidity in handling unsuccessful decisions is reduced.

The degree to which an increased emphasis upon department planning and management will result in these behavioral implications is in large part due to the sensitivity of management. It seems that with a growing awareness of these implications, the strengthening of department planning and management might serve to counteract instead of solely fostering the reduction of space of free movement and decreased feelings of essentiality. A rational approach to department planning and management will enable administrators to prove to others that some perceived inequities and inefficiencies in resource use were not the case. Moreover, a rational approach may result in a more equitable and justifiable use of resources during a period when decisions made on intuition alone are being challenged.

Areas for Future Institutional Research

As administrators at all levels become more cognizant of tools and procedures for academic department planning and management, efforts to research, develop, and apply new or improved department planning tools will increase. Based on the authors' experiences in the area of department planning and management, the following areas are suggested for future institutional research:

1. "Servicing" functions of departments. Administrators are becoming increasingly concerned with the costs of providing instructional courses to students from other departments as well as for ways to increase the number of their own students. In other words, there is need to understand the implications of "program" and department interrelationships.
2. Faculty workload systems. Although every institution and its departments have been operating under some faculty workload guidelines, there is a growing awareness of the need to develop workload systems that would consider the full professional life of faculty. New approaches might employ appropriate multicriterion measures for assigning faculty to different types and levels of activity in an equitable manner. Closely tied to faculty workload systems is the area of faculty evaluation.
3. Information for and about departments. The concern here is to identify and implement ways to improve the communication among the various administrative levels (i.e., enabling all administrators to be able to "tell their story").
4. Organizational consequences of obtaining and using information. In order for department planning and management to be enhanced institutional researchers must begin to address the organizational conditions and anticipated consequences under which department planning tools and information will prove useful. Furthermore, research on the incentives and disincentives that influence department planning and management is needed.
5. Department goal-setting and outcomes planning. There is a need for methodologies to help department administrators determine the scope and direction of the unit, set goals, and plan outcomes that will be in agreement with the institution's mission, role, and scope.

In summary, there is an increased demand to improve systematic academic department planning and management to enable administrators to find better ways to conduct their functions, allocate resources, estimate academic demand, and achieve their missions. In addition, since departments are highly dependent upon their interrelationships with other levels of administration, it is imperative that the role of department planning and management be better understood. Key (1970) mentions that if the department does not have a role as a functioning element in the total institution, it is a waste of time talking about how to be more efficient administrators. Moreover, administrators must be cognizant of their responsibility for making and implementing decisions that impact the academic department as well as the institution. While an information-based approach can provide a capability to facilitate department planning and management, the usefulness of the information must be considered in light of technological, organizational, and human behavior concerns.

An attempt has been made in the paper to discuss an information-based approach and its implications for academic department planning and management. To meet today's contingencies, information is needed and must be applied systematically in decisions pertaining to the execution of program operations. It is felt that information that is useful for department planning and management will also be useful for the overall management of the institution.

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[1] As staff members of the National Center for Higher Education Management Systems, the authors have been developing tools and procedures for department planning and management during 1973-1975 and this paper is partially based upon their observations and experiences with a number of higher education administrators.

[2] An information-based approach is described in detail in the *Academic Unit Planning Manual* (Miyataki & Gray, 1975). It has been designed to improve planning and management at the academic unit level within an institution by providing capabilities and procedures to obtain and communicate

more definitive information about the unit's functions, demands, resources, and outcomes and to focus on some key planning and management concerns/problem areas that pertain to the unit.

[3] The Unit of focus does not necessarily have to be centered around a function but can be other entities such as different levels of students, different kinds of resources, outcome categories, or what have you. But for purposes of the approach discussed in this paper, the authors believe that a "function" or "group of functions" as the *unit of focus* provides the administrator with the most comprehensive picture of the department's planning and management needs.

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THE RELATIONSHIP BETWEEN ORGANIZATIONAL VARIABLES AND INNOVATIVE PRACTICES IN SMALLER PRIVATE LIBERAL ARTS COLLEGES IN THE STATE OF OHIO

John J. Bowers
Research for Better Schools, Inc.

Small private liberal arts colleges, currently hard hit by higher costs, lower revenues, competition from state colleges, and dropping enrollments have received calls to be more innovative as a way of dealing with these problems (e.g., Carnegie Commission on Higher Education, 1972; Bolling, 1970). But little research has been done on what management systems correlate with innovation, especially in smaller colleges. If a college wishes to become more innovative, its management system must concern itself with how its work groups function, with the nature of its decision-making and goal-setting processes, its interaction and influence patterns, the mutual trust and confidence between levels of its organization, teamwork among its members, and other variables. By describing the management system and organizational functioning of more innovative colleges and identifying significant variables, we may provide an effective guide for those colleges which wish to innovate.

The purpose of this study was to establish a relationship between the existing degree of innovation in smaller liberal arts colleges in Ohio and the management system of those colleges as measured by instruments developed by Rensis Likert in his work in organizational development. The study proposed to demonstrate that colleges with more extensive innovative practices possess a management system which can be characterized as being closer to Likert's System 4 Participative Group model than those colleges with less extensive innovative practices.

Likert's System 4 Participative Group Model

Since the early 1950s, Rensis Likert has conducted research on the nature of effective work groups and has formulated his own model of how such groups function (Likert, 1961, 1967). In his schema, the management systems of all organizations can be placed along a comparative scale from System 1 to System 4.

System 1 Exploitative Authoritative places no trust in subordinates, communicates no information to them, uses fear as motivation, has an informal organization working against the goals of the formal organization, and demands unquestioning obedience to commands from the top of the organization. System 2 Benevolent Authoritative is not quite so rigid and appears to act as one might expect a stern but benevolent father; it still retains many of the disadvantages of the System 1 form. System 3 Consultative allows more participation by the members of the group. Members are consulted more, communication does occasionally go upward, and there is a moderate amount of cooperation and influence by subordinates. System 4 Participative Group, the model which Likert advocates, is characterized by wide communication upward, downward, and with peers; a full range of motivations; high satisfaction; a flow of accurate information; participation by all levels in making management decisions, and so on.

Likert has devised instruments for measuring the comparative management systems of different organizations. Originally used extensively in business and industry, they have been modified for use in public schools (Rensis Likert Associates, Inc., 1972) and, more recently, for use in colleges. Studies with the public school forms have shown that school systems closer to System 4 do more to satisfy interpersonal needs of teachers, have students with higher achievement scores, have better principal-central staff relationships, are more innovative, and have higher pupil satisfaction. The college forms which were used for this study have not been released publicly yet, but one study (Hanna, 1972) found that schools of nursing viewed by their faculty as closer to System 4 were more innovative than those closer to System 1.

Populations and Hypotheses

Different forms of the Likert College Profiles exist for presidents, deans, faculty, and students. Thus three populations were identified for examination in this study. *Administrators* consisted of all top administrators (presidents, vice presidents, and deans). *Faculty* consisted of 1 full-time teaching faculty, including department chairmen. *Students* included all full-time degree credit students at a college.

It was hypothesized that administrators, faculty, and students at more highly innovative colleges would rate their colleges' management system significantly higher (i.e., closer to System 4) on the College Profiles than their counterparts at less innovative colleges. Since this writer had previously demonstrated (Bowers, 1970) that students' perceptions of the administration become progressively less favorable and more critical from the freshman to the senior year, it was reasoned that, while this downward trend might exist at both types of college, it would be less sharply downward at the highly innovative colleges Thus it was hypothesized that there would be an interaction between students' year-in-college (freshman, sophomore, etc.) and the type-of-college (highly innovative or less innovative)

Procedures

To identify those colleges which could be classed as highly innovative and less innovative, a questionnaire was sent to the presidents of the 22 smaller (enrollment under 1400) private liberal arts colleges in Ohio. This questionnaire asked them to report the extent to which 38 selected educational innovations existed on their campuses. This instrument was based on one devised by Brick and McGrath (1969) and later modified by Opacinch (1973). From the 21 responses, mean scores were calculated for each college, and two highly innovative and two less innovative colleges were selected which agreed to participate in the remainder of the study.

The Likert College Profiles were mailed to the various populations in each of the four participating colleges. All four presidents returned their questionnaires. Of the 12 vice presidents (3 at each college), 11 responded. Of the three deans, all returned their forms (one highly innovative college had no position of dean). All faculty were sent the Profiles and 106 (65%)responded. The forms were also sent to a random sample of 15% of the student bodies. Of these, 296 (74%) responded.

Analysis

A mean and a standard deviation were calculated for each item on each form for the populations. Results were compared by group for the four colleges and the two college types (i.e., highly innovative and less innovative). Since, for the administrators and the faculty, a total population of respondents was being dealt with, parametric statistical tests were not needed.

The student responses were factor analyzed utilizing a varimax rotation which is an orthogonal rotation. Thus factors were obtained which had little or no correlation with each other. Factor scores were derived for each student on the resulting factors. Using these factor scores, it was then possible to conduct an analysis of variance for each factor to test a main effect of membership in type-of-college group (i.e., highly innovative or less innovative) and for interaction between type-of-college-and year-in-college (i.e., freshman, sophomore, etc.) The data was arrayed in a 2 × 4 analysis of variance for the type-of-college and the year-in-college variables, respectively. There are two levels nested within the type-of-college variable corresponding to the two colleges comprising each level.

Ratings for the individual items range from a possible low of 10 to a possible high of 49 for a total scale range of 40 points. Ratings on such a scale can be viewed as corresponding to Likert's four management systems. For example, ratings from 10 to 19 indicate a rating falling within System 1; from 20 to 29 fall within System 2; and so on.

Results

Results from the administrator population were difficult to interpret because of the small numbers involved. Responses of the four presidents revealed no consistent pattern; ratings on nearly all items fell in the 35-45 range thus indicating that all four saw their colleges as having management systems in the high System 3 or low System 4 range.

Comparisons for the three deans were equally difficult, but here a pattern was more evident on some items. An examination of those items where the responses of the one highly innovative college dean differed widely from the mean response of the two less innovative college deans showed that he:

- saw department chairmen, faculty, and students as being more free to talk to him.
- was willing to give faculty more say about academic and non-academic matters.
- perceived decisions as being made more broadly throughout the college with administrators, faculty, and students participating in decisions that affected them.
- perceived students as being more involved in major decisions on college matters.
- saw his president as having less influence and students and faculty as having more influence in what goes on in the college.

A comparison of the mean item responses of the 11 vice presidents (6 from the more innovative colleges) revealed some very striking differences, however. Of the 77 items on the form, the highly innovative college vice presidents had higher (i.e., closer to System 4) means on 75 items, 52 of those means being higher by over 4 points (i.e., 10% of the possible scale range). Thus, at least for the vice presidential ratings, the hypothesis that administrators at the highly innovative colleges would see their management system as being closer to System 4 was accepted.

Space does not permit a complete explication of the mean responses to the 87 items of the faculty form. Examination of the means showed the highly innovative college faculty had higher mean ratings on 68 items and lower mean ratings on 18 items (with one tie). Of the 68 higher means, 23 were over 4 points higher. Items on which the highly innovative college faculty had lower means usually asked them to comment on administrative roles or their own practices in dealing with students. An examination of the individual item ratings showed that (compared to the less innovative college faculty) the highly innovative college faculty.

- seek and use students' ideas on academic matters more often.
- are willing to give students much more say in decisions on the subject matter of courses an also see their students as actually having much more influence.
- see students as being more involved in major decisions affecting them.
- rate their college more highly as being a good place to work.
- perceive the administration as more often seeking and using students' ideas about both academic and non-academic college matters.
- see more extensive, friendly, and trusting interaction between faculty and administration, and between faculty members.
- perceive faculty members, students, and department chairmen as having a greater degree of cooperative teamwork.
- are aware of considerably more extensive discussion and group participation in the decision-making process in their colleges.
- see themselves as much more involved in decisions related to their work, and that this participation in the decision-making process contributes to the desire of faculty to do a good job.
- are more critical of themselves in that they see their students as less free to talk to them on coursework or emotional problems; and that they know less well the problems faced by their students in their college work.

When asked about specific groups (e.g., the president, the faculty, the students), faculty at the more innovative colleges were willing to give less influence in college matters to the administration and more say to faculty and students than those faculty at less innovative colleges. This result is illustrated in Figure 1. Another interesting finding (see Figure 2) was that the highly innovative college faculty rated their presidents lower, but their academic vice presidents higher, as administrators, as educators, and as specialists in their own field. This may indicate that the highly innovative college faculty

Figure 1

FACULTY RATINGS OF DESIRED INFLUENCE FOR VARIOUS GROUPS[a]

In general, how much say or influence do you feel each of the following should have in what goes on in your college or university . . .	Highly innovative colleges	Less innovative colleges	Difference[b]
the president?	37.3 (9.5)	42.6 (8.7)	− 5.3
your academic vice president?	37.8 (9.6)	37.4 (11.0)	+ 0.4
other vice presidents?	31.9 (12.0)	36.1 (10.8)	− 4.2
deans?	39.3 (8.0)	40.6 (7.9)	− 1.3
department chairmen?[c]	37.7 (9.1)	37.3 (7.8)	+ 0.4
faculty?	40.2 (8.2)	35.0 (8.5)	+ 5.2
students?	35.8 (9.9)	25.8 (8.0)	+ 10.0

[a] The mean rating is the upper figure with the standard deviation below in parentheses.

[b] The difference is calculated as the highly innovative college mean minus the less innovative college mean.

[c] The role of department chairman did not exist at one highly innovative college and was in the process of formation at one less innovative college.

respect their academic vice president more and might possibly look to him, rather than their president, for leadership in academic innovation.

In brief, faculty at the highly innovative colleges perceive their colleges as having management systems closer to Likert's System 4 Participative Group model and apparently are more willing to accept and foster such a system. They want more influence for groups lower in the organizational hierarchy (such as faculty and students), and see more teamwork and participation in decision-making at their colleges. Thus, the hypothesis that highly innovative college faculty would rate their colleges' management system closer to System 4 was accepted.

The factor analysis of the student data produced ten factors which were interpreted and labeled. These are presented in Figure 3. Figure 4 gives the mean factor scores for the two types-of-college and for the four individual colleges. These factor scores are standardized with a mean of 50 and a standard deviation of 1. The analyses of variance conducted on the ten sets of factor scores revealed no statistically significant main effect for any factor. Significance was difficult to achieve because of the small number of colleges involved. With the indicated degrees of freedom, an F-statistic of 18.51 would have been needed to achieve significance at the .05 level. Thus, with no statistically significant main effect, the hypothesized interaction between type-of-college and year-in-college could not be examined. The analysis of variance for the main effect is summarized on the left side of Figure 5. However, the results for the nested variable (i.e., the individual colleges nested within the type-of-college groups) did reveal significance at the .05 level or better for 8 of the 10 sets of factor scores. This is shown on the right side of Figure 5.

Examination of the mean factor scores in Figure 4 does, however, reveal some substantial differences in student perceptions between highly innovative and less innovative colleges. For 5 of the 10 factors, the mean factor score of the highly innovative colleges differs from the mean of the less innovative colleges by better than plus or minus 0.5 (i.e., more than one-half of a standard deviation). The means were substantially defferent on *Factor 2 Administrative competence and commitment; Factor 4 Actual student influence in college matters; Factor 5 Desired student influence in college academic matters; Factor 8 Concern for financial resources;* and on *Factor 10 Desired student influence in non-academic college matters.*

Examination of the items loading highest on these factors revealed that, compared to students at the less innovative colleges, the students at the highly innovative colleges.

— see the administration and faculty as more often asking for and using their ideas on both academic and non-academic matters; and perceive the administration and faculty more willing to accept student influence in college matters.

— want and have more influence in academic matters such as the subject matter of their courses; and say

Figure 2

FACULTY RATINGS OF COMPETENCIES OF PRESIDENTS AND ACADEMIC VICE PRESIDENTS[a]

	How much competence does your president have . . .			How much competence does your academic vice president have . . .		
Roles	Highly innovative colleges	Less innovative colleges	Difference[b]	Highly innovative colleges	Less innovative colleges	Difference[b]
as an administrator?	28.0 (12.3)	36.9 (10.7)	− 8.9	38.3 (9.5)	29.0 (12.1)	+ 9.3
as an educator?	27.6 (11.0)	31.0 (10.9)	− 3.4	36.1 (7.4)	31.7 (11.0)	+ 4.4
in his own specialized field?	33.8 (11.0)	37.6 (10.5)	− 3.8	40.3 (8.7)	33.1 (11.1)	+ 7.2

[a] The mean rating is the upper figure with the standard deviation below in parentheses.

[b] The difference is calculated as the highly innovative college mean minus the less innovative college mean.

that having such influence makes the students want to work harder.

- perceive their administrators as having less concern, and themselves as having more concern, for the efficient use of financial resources.
- perceive their president and academic vice president as less competent as administrators, as educators, and as specialists in their own field; and see both these individuals as having a lower level of goals concerning educational excellence.
- want more say in non-academic college matters.

Thus, the students display a pattern of responses very similar

Figure 3
DESCRIPTION OF FACTORS DERIVED FROM STUDENT DATA

Factor 1 — Mutual student-faculty trust and confidence

Confidence and trust which students and professors have in each other; extent to which professors try to help students with their problems.

Factor 2 — Administrative competence and commitment

The competence of the president, academic vice-president, other vice-presidents as administrators, as educators, and in their own specialized fields; their level of goals concerning academic excellence.

Factor 3 — Importance of higher education

The extent to which department chairmen, faculty, deans, academic vice-president, president, and students feel that higher education is extremely important.

Factor 4 — Actual student influence in college matters

How often the administration and faculty ask for and use student ideas in academic and non-academic college matters; perceptions of how much say the faculty and administration think students should have.

Factor 5 — Desired student influence in academic college matters

How much say students should have in academic college matters (as viewed by students); extent to which having influence in subject matter of courses makes students want to work harder.

Factor 6 — Mutual, student-administration trust and confidence

Extent to which students and administration have trust and confidence in each other; how students view communications from the administration; how well administration knows problems students face in course work.

Factor 7 — Allowance for influence of various groups

How much influence students feel the president, academic vice-president, other vice-presidents, deans, faculty, and students themselves should have in what goes on in the college.

Factor 8 — Concern for financial resources

Extent to which department chairmen, faculty, deans, and top administrators display concern for the efficient use of financial resources.

Factor 9 — Student support and friendliness

How often students seek to be friendly and supportive to faculty, administration, and other students.

Factor 10 — Desired student influence in non-academic college matters

How much say or influence students would like to have in non-academic college matters; how much say faculty and administration think students should have (as seen by students).

Figure 4
FACTOR SCORE MEANS FOR TYPE-OF-COLLEGE AND INDIVIDUAL COLLEGES[a]

Factor	Highly innovative colleges			Less innovative colleges			Difference[b]
	College 1	College 2	Combined highly innovative	College 3	College 4	Combined less innovative	
1	50.46	49.62	50.04	50.30	49.83	50.06	0.02
2	49.21	49.49	49.35	50.45	49.77	50.11	0.76
3	49.66	49.98	49.82	50.12	49.73	49.92	0.10
4	50.96	50.11	50.54	49.91	49.35	49.63	0.91
5	51.00	50.29	50.65	49.60	50.01	49.81	0.84
6	49.97	49.85	49.91	50.15	49.55	49.85	0.06
7	49.11	50.02	49.57	50.05	49.77	49.91	0.34
8	50.99	49.83	50.41	49.96	49.69	49.83	0.58
9	49.49	50.16	49.83	49.93	49.96	49.95	0.12
10	49.57	49.59	49.58	49.63	50.84	50.23	0.65

[a] Factor scores are standardized with a mean of 50 and a standard deviation of 1.

[b] The difference is the absolute difference between the highly innovative college mean and the less innovative college mean.

Figure 5

SUMMARY OF ANALYSES OF VARIANCE

Factor	Type of college			Individual colleges		
	Mean Square	$F_{1;2}$	p	Mean Square	$F_{2;276}$	p
1	0.019	0.002	ns	8.314	8.407	0.0003
2	20.227	4.300	ns	4.704	5.572	0.0042
3	0.410	0.179	ns	2.288	2.290	0.1302
4	29.257	3.250	ns	9.002	11.092	<0.0001
5	24.858	4.240	ns	5.855	5.689	0.0038
6	0.129	0.039	ns	3.303	2.783	0.0636
7	4.199	0.518	ns	8.115	7.781	0.0005
8	12.123	0.970	ns	12.495	11.173	<0.0001
9	0.525	0.130	ns	4.037	3.445	0.0333
10	14.882	1.151	ns	12.931	13.128	<0.0001

to that of the faculty. Students at highly innovative colleges want and have more influence and participation in decision-making in academic and non-academic matters. They are more critical of traditional administrator roles of president and (unlike the faculty) also critical of their academic vice president. They more often see the administration and faculty as asking for and using their ideas. The pattern of faculty responses shown in Figure 1 is essentially repeated for the students on the same questions.

Despite the lack of statistical significance, there appear to be some substantial differences between the college groups in crucial areas which suggest that students at highly innovative colleges do perceive the management system of their college as being closer to Likert's System 4. Further research in this area with a larger number of colleges is recommended.

Conclusions

From the results of this study, it appears that more innovative colleges do have management systems which can be characterized as being closer in practice to the System 4 Participative Group model advocated by Likert. The results suggest that at more innovative colleges: (a) there is a broader participation in decision-making; (b) the ideas of groups traditionally lower in the organizational hierarchy, such as faculty and students, are asked for and used more often; (c) there is a desire for, and a practice of, giving more influence to faculty and students; (d) there is less respect for, and a desire to give less influence to, the president; and (e) the faculty is more likely to look to the academic vice president as a competent administrator and educator. A college which wishes to become more innovative may therefore want to make some changes to its organizational and management structure and practices to move toward a System 4 management model.

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MANAGERIAL GROWTH IN HIGHER EDUCATION: IS THE TAIL WAGGING THE DOG?

Irving H. Buchen
Fairleigh Dickinson University

"Just because I am paranoiac does not mean
they are not really persecuting me."
—Saul Bellow. *Mr. Sammler's Planet.*

Offices of institutional research, created and funded by administration, seldom study the administration. It is understandable. If one of the cynical legacies of Watergate is "Don't ask; you won't like the answers," then perhaps the operating strategy of institutional research is "Don't study the room at the top; it may be too close for comfort." But it is also a serious sin of organizational omission, for no study of the internal workings of an organizational, which fails to identify and to define the structure and especially the changing structure within which that organization functions, is reliable. To be sure, it may be reassuring. It may cater to the momentum of intactness and thus minister to the desire of every organization to perpetuate itself without alteration in the future. But in the process it offers top decision-makers the illusion that everything is changing but them; it falsely props up their indispensability or martyrdom; and finally encourages an insularity that does nothing to ameliorate the polarized mentality of "them" and "us." Insofar as institutional researchers ignore the structural environment or seal off its uppermost portions as sacred groves, they themselves are compromised as researchers and are forced to become obedient and uncritical extensions of an unexamined structure. No more dramatic example of such uncriticality perhaps can be found than the tendency for institutional research to avoid examining a significant trend of which they themselves are a central part: the substantial increase of middle-level managerial and supervisory personnel in higher education.[1]

If the increase were solely a quantitative matter, it still would be important to identify and to document the trend, if for no other reason than the number of such appointments as well as the extensive support services they require to underpin their operations involve budgetary consequences of considerable importance for current and future solvency and fiscal planning. But the issue involves qualitative and normative dimensions as well; it not only affects faculty, but also is unaffected by faculty. For by virtue of the delegation of duties and the chain of command, middle-level managers as extensions of administration are either exempt or immune from academic review. Now as everyone knows faculty are notoriously obstinate or opaque when it comes to recognizing the values of management science or Management by Objectives (MBO). Moreover, they are almost paranoiac when they suspect that their precious preserves are being invaded by managerial poachers. But for a cantankerous and hopelessly inefficient lot, it is perhaps crass to mention that faculty alone directly generate tuition income and/or subsidy; and it is no exaggeration to claim that faculty thereby pay the salaries of middle-level managers and even presidents, rather than the reverse. In fact, if one of the clear patterns to emerge from collective bargaining is the general raising of the budget consciousness of faculty, what may soon surface in the future is a raising of their managerial consciousness as well. Moreover, I would contend that their current distrust of administrative intrusion and dominance is not without basis in both fact and practice.

The most dramatic way of putting the qualitative issue is the dawning perception that administrators and supervisors with academic credentials increasingly are making mostly nonacademic decisions (parking lots, sewerage systems, fauna and flora, etc.); and that supervisory personnel without academic credentials or without comparable academic credentials increasingly are making academic or academically-related decisions. Here is a sampling of some of those latter decisions presented in the characteristic form of unilateral memoranda:

Memo from Personnel: No full-time faculty slot or line, whether it becomes available because of departure, termination, retirement or death, is to be considered automatically vacant. DO NOT BEGIN TO ADVERTISE OR TO INTERVIEW PROSPECTIVE CANDIDATES. Rather, a petition of vacancy must be filed using the attached forms and routing procedures. This does not apply to staff or supervisory positions.

Memo from Registrar: All students not on the official class roster are to be denied access to class.

Memo from Admissions: It is not possible for us to send out your special materials to merit scholars because it cannot be factored into our geographical cross-matrix.

Memo from Records: This is to inform you that the following graduate students who have not registered for courses this semester are being placed in the inactive file; and will have to pay an application fee to be reactivated.

Memo from Dean of Students: The following students should be excused from classes and assignments on the following days in order to attend intercollegiate student senate meetings.

Memo from Evaluator, Graduate Admissions: Do not admit any more graduate students until we have cleared up our paper work.

Memo from Division of Institutional Research: Please do not use the last report on numbers of students and credit hours by college to come to any personnel or budgetary decisions.

The issue of managerial growth and its quantitative and qualitative impact on higher education merits serious and extensive study. What is presented here is a beginning step in that direction. As a possible model for further research, I will offer first a series of statistical profiles which measure from

MANAGERIAL GROWTH

1960 to 1974-75 the growth patterns of major components within a college or university. Hopefully, that will provide some reasonably precise numerical holds on comparative growth rates and structural alteration. Second, I will present a more detailed breakdown and analysis within the same time frame of certain non-teaching units along a longitudinal line to determine not only the extent but also the nature of the changes. The third and final section will offer a series of operating conclusions based on the first two parts and tilted in the direction of suggesting some of the research and decision options for the future.

Growth Patterns

The case-history base employed here consists of three four-year colleges and universities: a large state university, a small private liberal arts college and a large private university. Because of substantial differences in size and numbers, relationships are presented in ratios and as a single composite entry for all three schools. The major components within each school that were identified, factored, and analyzed are:

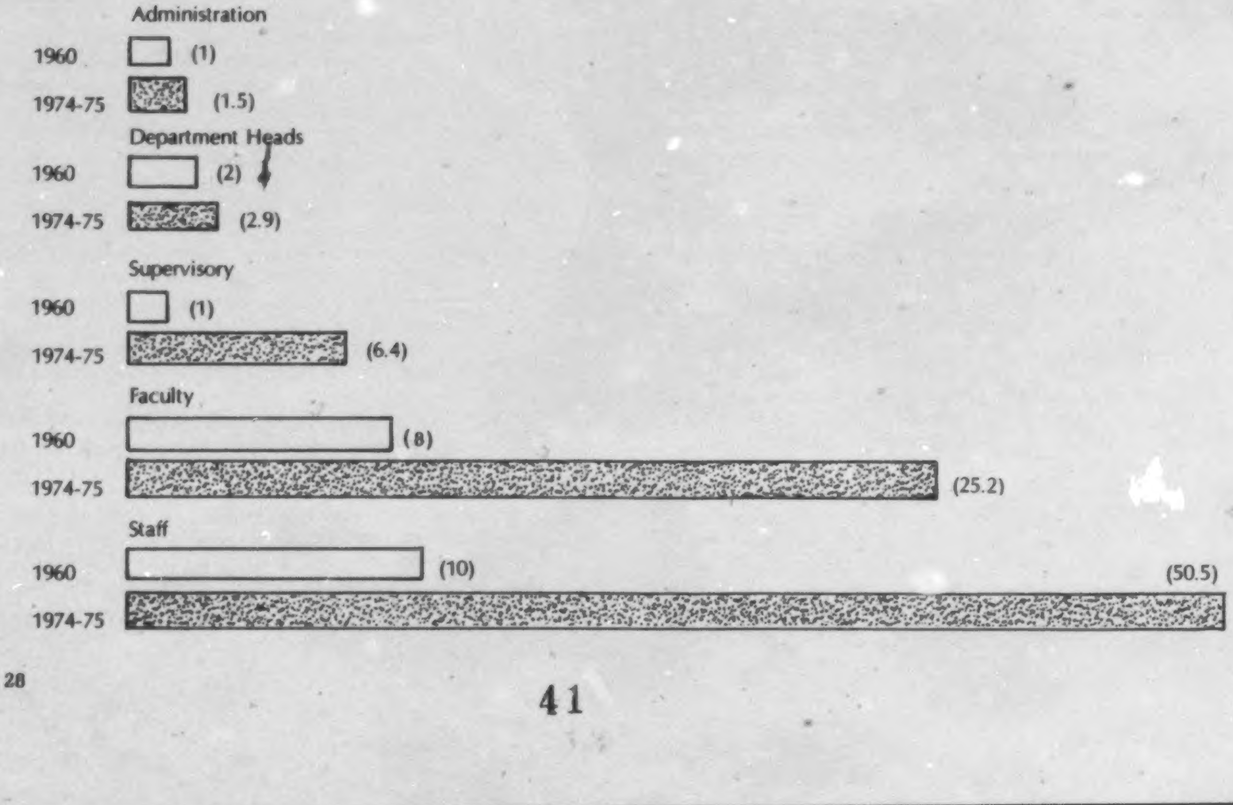
1. Senior Administration (president, vice-presidents, provosts, deans, etc.)
2. Department or Division Heads
3. Supervisory or Managerial Personnel (includes various assistants to senior administration)
4. Faculty (Full-time and FTE)
5. Staff Support Services
6. Students

The time frame is 1960-1975, which was sampled in five segments: 1960, 1965, 1970, 1972, and 1974-75.

When the figures for 1960 are set side by side with those for 1974-75, the following trends and structural shifts are discernible:

1. During the period faculty tripled in size; so did student enrollment.
2. In 1960 the number of senior administrators and of middle-level supervisory personnel was essentially the same. The total number of department or divisional heads equaled the combined total of senior administrators and supervisory personnel. The overall image of higher education in 1960 was one that was faculty-centered in terms of numbers. The managerial image was symmetrically balanced between senior administrators and supervisory personnel. Presidents, vice-presidents, provosts and deans were highly visible in 1960 and seemed to command a strong and comprehensive overview.
3. By 1974-75 both senior administrators and department heads kept close pace with each other and shared the same relatively small growth rate. But within the same time period supervisory personnel grew six-fold. The only other component that matched that growth rate was that of support services.
4. The growth rate of supervisory personnel was twice the combined growth rate of both senior administrators and department heads; or equal to the combined growth rate of all faculty and senior administrative personnel. The managerial image in 1975 presents a dramatic shift which appears in the structural insertion of a new middle level between

Figure 1
GROWTH PATTERNS BY UNIT



senior administrators, and faculty and department heads.

5. In terms of overall growth, 1970 was the pivotal year. By that year faculty increased by as much as *65% and supervisory personnel by over 70%*.
6. The first academic year to register any clear-cut slow down or actual decline is 1974-75. Student enrollment showed a slight decline of from 1 to 2%. Although neither senior administrators nor department heads were affected by the drop, faculty immediately were. The average drop in faculty numbers was about 9%; staff support numbers declined by 8%. The only unit to depart from the entire pattern was that of supervisory personnel who in the same year registered an average growth rate of about 9%; ironically, the same figure for faculty reduction.[2]
7. Although budgets are classified information and generally unavailable to outsiders, what few sample figures could be gathered suggest that the patterns described above may be just the tip of the iceberg in terms of dollars. For example, at one of the three schools surveyed, the operational budget of Student Services in 1972 exceeded the combined operational budget of all the three colleges at that particular university.

Extent and Nature of Change

At this point it might be meaningful to refine the analysis by examining the growth of certain major representative non-teaching or non-academic units that involve supervisory personnel and support services. Here the emphasis is not just on numbers but on the structural nature of internal expansion and organization. The two I have selected are Admissions and Student Services.

From 1960 to 1974-75, Admissions more than doubled in size and thus slightly exceeded the growth rate of senior administrators and department heads. Equally as important, its general shape changed. In the 1960s Admissions was essentially undifferentiated as to specialities. The Director of Admissions and his or her assistant constituted the presiding professionals with the operation generally handled as essentially a singular and non-disaggregated enterprise. But by the early 1970s the entire configuration changed. Separate categories and staff were designated for full-time students, part-time students, transfer students, graduate admissions, etc. The position of admissions counselor was created to minister to rites of passage and a substantial increase in the travel allowance budget was provided.

What emerges then is a differentiated growth pattern that is quantitatively attuned to the rate and diversity of student enrollment. Equally as important, there is greater qualitative concern with identifying and ministering to different kinds of students and with being conversant with the different curricula options available to students. Significantly, at all three schools faculty participation in "Open Houses" sought by Admissions staff was substantial.

Student Activities, although an amorphous operation that varies considerably from university to university, generally has acquired a substantial presence in higher education for a number of reasons. It is usually headed up by a Dean of Students (or a combination of Dean of Men and Dean of Women). Such a dean or deans frequently have equal voice and vote with deans of colleges on a Council of Deans. Finally, Student Activities has at its disposal substantial sums of money from student activities fees.

Student Activities generally has grown nine times its original size by 1974-75 from what it was in 1960. Its companion subsidiary, the Counseling Center, increased four-fold during the same time period. As with Admissions, so here the pattern of greater specialization applies. Thus, various administrative associates or assistants to the Dean of Student Activities are apportioned to dormitory students, full-time commuters, part-time commuters, etc. Liaison personnel are hired to work with students involved in the Student Senate. Counseling has become similarly specialized. Special personnel are assigned to psychological, academic and pastoral counseling. Community relations are handled by a staff member in charge of volunteer services. Many Counseling Centers offer special programs in reading comprehension and study skills.

The net result of the rate and nature of growth of Student Activities is the structural creation of a college within a college. In terms of the array and range of services ministering to student life and welfare, what in effect has been created is a double service system in which the services provided by Student Activities and the educational services provided by the faculty have acquired an official and structured parity, perhaps unique in the history of higher education. Indeed, in terms of funds available to underwrite student academic activities, Student Activities has more monies at its disposal than the budget lines for all departments combined. Unlike Admissions, there is little or no faculty participation sought in Student Activities.

Conclusions and Options

I believe it is meaningful now to list a series of tentative operating conclusions on the basis of the selected analysis of rates and nature of growth patterns.

1. From 1960 to 1974-75, and especially between 1970 and the present, there has been created a corps of middle-level managers and supervisory personnel without precedent or parallel in the history of higher education. Specifically, the six-fold increase of such personnel over a 15 year period is matched only by the same increase in staff support services with which it evidently enjoys an understandable and direct correlation.
2. During the same period faculty growth generally has kept pace with the three-fold increase in student enrollment; thereby establishing a different and competing pattern of correlation.
3. Both the numerical growth of non-teaching units and personnel as well as the intensive differentiation into areas of expertise have brought about a structural change which resembles the creation and operation of a series of new departments or disciplines. Thus, although none of the middle managers has or is eligible for tenure, the increasing services they provide over the years appear to have acquired the permanence of tenure. This seems to be born out by the most recent figures which isolate middle-level managers as the sole component continuing to grow in 1974-75. Moreover, in some universities the policy of freezing new faculty appointments or justifying the filling of positions vacated by termination, retirement, or death often has no policy counterpart in the area of supervisory personnel.
4. Insofar as the substantial growth of supervisory per-

sonnel has arisen out of the need of senior administrators to delegate duties and responsibilities which they can longer manage effectively, then there is a serious question whether top administrators at present are in possession of the comprehensive overview which it is their responsibility to maintain.

5. Given the nature of the territorial imperative, both quantitatively and qualitatively, supervisory personnel and staff support services have expanded their spheres of operation to the point where they constitute a managerial and service counterpart to faculty operations. Although faculty generally were unaware of or unconcerned with the extent of growth of non-teaching units and personnel in the past largely because in an expanding situation there was enough to go around for everybody, the presence and pressures of such units and personnel are being perceived now by faculty increasingly in the form of academic intrusions. It is not only that non-academic units and personnel are exerting controls or making decisions which affect academic areas, but also that such controls and decisions are out of all proportion to their academic competence and their relationship to student enrollment and tuition generation. Because the issue joins both the quantitative and the qualitative, budget and credentials, structure and ideology, it is reasonably certain, especially given the momentum of collective bargaining, that clashes between faculty and supervisory personnel will escalate to the negotiating table.

On the basis of the statistical trends and the structural shifts, there are certain reasonably clear and overriding research and decision options suggested for future planning.

1. The most obvious and perhaps the most important is that offices or divisions of institutional research be authorized to undertake detailed studies of the organizational growth patterns of their own universities and in particular factor in budget equivalents.
2. Institutional researchers also should be authorized to undertake a companion study of the extent to which senior administrators over the years have parceled out portions of their overviews to supervisory or managerial personnel; what effect, if any, that has had on the decision-making process and on the direction and comprehensiveness of information flow; and, finally, what have been the cost/benefits of such decision-sharing.
3. Colleges and universities which already have in effect or are contemplating faculty freeze policies or even RIF, and where there is no policy counterpart covering non-teaching or non-academic units and personnel, should immediately extend such policies to those units and personnel.
4. Since the rate of growth of both supervisory personnel and staff support services generally has not been correlated to the rate of student enrollment, whereas that of faculty generally has, there is a clear need to bring supervisory and staff support services in closer correlation to student enrollment, especially if such personnel do not directly generate tuition income and/or subsidy. In the process, there should be careful reassessment of the extent to which a whole battery of student services, such as psychological or pastoral counseling, should even be provided students as a university service rather than an individual option; and whether other services, such as reading comprehension or study skills, presently being offered without charge and academic credit, should not be made part of the academic program where credit can be granted and tuition charged.
5. But by far the most comprehensive and delicate task, of which the last point is but a portion, is to undertake a total re-examination of all the major components of a college or university toward the end of determining priorities. One way of beginning such a reassessment in the most general terms is to make use of an impact or future wheel which is often used to describe and to measure the multiple orders of impact when introducing a new technology. It functions like the proverbial stone dropped into a pool of water which sends out wider and wider concentric ripples, each one indicating the first, second, third, fourth, etc. order of impact.

The key to its use in a complex organization is to run through a number of wheels with different centers; and then subsequently to overlay them to determine consensus priorities. For example, at the center one can place the general determiner of student enrollment, increasing or decreasing, and then make a series of determinations as to what is most essential to support student enrollment. The first circle then might contain faculty and admissions as enjoying a top priority with Student Activities occupying the fifth or last position of priority. If, on the other hand, the college or university is substantially residential and it can be demonstrated that student services are part of what encourages a student to apply, then Student Activities might enjoy a much higher, even a first, priority.

The entire process can be further refined by measuring other centralities, such as the goals and mission of the university, and what units of the university most directly and peripherally support those goals. If one of those goals is a commitment to career education and placement, that might produce a different configuration and sorting out of priorities. Or the issue of student retention might be centered as being as important as initial student enrollment. Once the various wheels have been spun out and the orbits coincided hopefully into general priorities, the final configurations can be quantified in order to develop a series of contingency bases for decision-making. For example, what would be the impacts of a 2%, 5%, 8% decline in enrollments? Each unit within the university can similarly be quantified in percentage units. Thus the formula might be that a 2% decline in enrollment results in the possibility of contemplating a cut in the Counseling Center of one full-time counselor. In other words, those units which have the lowest priorities in various assessments are the first to be eligible for reduction in force.

My own preference is that such priority assessments should not be placed exclusively in the hands of institutional researchers or senior administrators, but be extended comprehensively to all units of the university. All genuine participatory planning processes are inevitably anticipatory. But whether or not that suggestion seems feasible and whether or not the particular configuration mode I have suggested seems fruitful, what I believe is abundantly clear from even my tentative and exploratory efforts here is that unknowingly higher education increasingly has taken on the character and shape of a corporate structure.[3] It is not surprising in this connection that efforts to introduce college senior administrators and middle-level managers to the virtue of MBO and Management Science are meeting with such success. Do not misunderstand me: I believe we should be open to all the help we can get. But my contention simply is that faculty already are the equivalent of middle-level managers; and further that in times of limited or zero-growth, no organization can afford to support two separate groups of middle-level managers, especially one that grows at twice the rate of the other and without directly generating income. In short, whatever basic contributions the corporate system can make to higher education already has been made; whatever else it can contribute is characterized more by the law of diminishing than increasing returns. If the tail continues to insist on wagging the dog, a number of dogs may bob their tails; a few may even discard the tail as an unnecessary appendage in the evolution of the species.

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1. I found nothing in the otherwise sound and often comprehensive contents of the following two most recent books on university organization to alter this judgment: Balderston, F. E. *Managing today's university.* San Francisco: Jossey-Bass, 1974; Gross, E. & Grambsch, P. V. *Changes in university organization, 1964-1971.* New York: McGraw Hill, 1974.
2. Lest one conclude that RIF means only Reduction in Faculty, the example of the University of Bridgeport should be cited. Staff was trimmed nearly 18% during the last 2 years. That comprised the elimination of 16 administrative positions and 721/2 maintenance and clerical positions. The resultant savings was about $764,000 a year or about nearly 5% of the operating budget.
3. The reluctance to perceive the corporatism of higher education and to establish limits to its growth may, in fact, result in a transformed structure which, in turn, radicals are looking for as an assault point. If that seems alarmist or hysterical, see Mike Yates and Bruce Williams, "What radicals can do for teachers unions," *Change* (Winter, 1974-75), 8-9.

INFORMATION NEEDS IN SUPPORT OF PLANNING IN SMALL COLLEGES

Stanley M. Frame
Azusa Pacific College

Planning is a familiar activity. It exists in every organized form of society. It is an instrument of structured change, permitting study and research to sift out the best ideas and form them into a lasting structure.

Colleges and universities across the nation are realizing the increasing demand to plan for more than just present needs. In order to be contemporary tomorrow they must look ahead today. Many have met this need by developing long range plans of improvement. This enables the school and its faculty to assess its strengths, weaknesses and needs in every area and to begin to find new ways and means of improvement.

The perennial need for planning has, in recent years, been highlighted by the "honeymoon" in higher education. During the 1950s and 1960s support for higher education ran high philosophically and monetarily. Faculty and professional staff rosters expanded as did services to students. Small liberal arts colleges cashed in on the tidal wave to build science buildings, dormitories and other facilities. Programs increased as NDEA and other federal acts as well as private foundations provided the funds. Colleges and universities were experiencing unprecedented growth and the assumption that this would continue conditioned the management of these institutions. There were, therefore, no incentives for setting priorities in comprehensive planning or budgeting. Much of what occurred did so as much through chance as through design. Little thought was given to long term implications of policies or how they fit into institutional priorities and goals. If deficiencies developed in the system as a result, additional funds were always forthcoming to make up for them.

This management behavior has been classified as "solution by additions." If facing difficulties could be postponed long enough, time would solve most problems because of the growth rate.

However, the heyday of higher education came to an abrupt end during the last few years. The honeymoon ended due to a variety of reasons—economic, cultural, social, and just the reduction in the number of students. The problem of reduction takes on greater proportions when one realizes the current environment has created decreasing resource supplies, increasing demands in terms of breadth, and increases in the cost to meet those demands. The responsibilities to provide high quality education to students are the same today as they were ten years ago, but the means to do so are not the same.

During this "post-honeymoon" era, many small schools will be hard pressed to search for suitable decision-making tools to assist the planners in the difficult task of charting the course for the institution in the uncertain years ahead. The higher education literature is replete with software "systems" as well as hardware "gadgetry," both of which are presented in such a way that one feels that selecting this program or that computer will surely lead the institution to the grand and glorious paradise for higher learning. A whole new vocabulary has suddenly been thrust upon the higher education community and, indeed, at the present time there is serious discussion regarding a common language—a language that would permit comparison and interchange of information relative to selected institutional inputs, functions and products.

Being small college oriented, and a bit simple-minded at that, it seems to me that what is needed is not another treatise on the complexities of the science of data management, but rather a simplistic look at basic information needs to support planning operations in small colleges.

Transactional Data

The first task is to collect simple, reliable data on higher education operations. Certainly this is not a new function, and to do so on most small college campuses does not require a great deal of sophistication. For example, administrators have always needed to know how many students are registered in each course that the institution offers.

The second point I would make is related to the efficiency of capturing that data. Hopefully, data should be recorded one time for all uses. I am sure your students are just as frustrated as ours when we seem to continually ask them for certain basic information such as name, social security number, address, parents' address, residence, birthdate, and so on. The goal of data capture efficiency is to gather this information at the most timely and convenient location. Then subsequent interactions with the data source should necessitate only periodic verification of the accuracy of the data (has the student moved, has his marital status changed?).

What we are creating here will be the first level of a three-level pyramid building on what I will call transactional data. There is nothing new about transactional data. It includes data of various kinds: for what courses did each student register? how many students are in each class? what courses does each faculty member teach? where and when does each course meet? names, addresses and other personal identification information on applicants for admission, etc. I believe most colleges maintain information at this level in these general categories: recruitment, registration, faculty, student, financial, and development or fund-raising.

Profile Reports

The next level in the pyramid I propose is what I call the profile level. It is at this level that most of the so-called management reports are developed. This kind of information is characterized by the putting together of two or more discrete classes of transactional data to provide a picture or profile of some aspect of institutional functioning. Some kinds of information generated at this level might include a comparative profile of admitted and rejected applicants by ability level, schools and colleges previously attended, geographic regions, or church denominations; a comparative profile of admitted applicants who enroll and "no-shows" by such factors as date of application, income level or financial need; the numbers and percentages of enrolled students by various categories such as program major, grade point average, income level, or credit hours completed; student financial aid information including family income levels, sources of financial aid, average amounts of college funds used; faculty profiles by department showing the number of student credit hours produced, the number of credit hours taught, terminal degrees held, or salary levels; information about numbers of classes by department displayed by enrollment; and information about the cost per credit hour by department, by degree, or by major. Much of this kind of information is already collected and tabulated, sometimes by hand, sometimes by computer, on most campuses. Reports on this level are very effective in communicating to top management something of the activities of the institution as seen one step above the transaction level.

Planning Needs

It is at this last level that we move beyond profiles based upon data on higher education operations. The objective is to relate these organizationally-focused data to the needs of program-oriented planning.

Planning is recognized as future-oriented. It is the conscious effort to determine and select operational objectives, identify feasible alternative programs available to accomplish these objectives, calculate the resources necessary to support the program, evaluate alternative programs, implement the planned programs, and evaluate the output or results for correction, modification or recycling. Azusa Pacific College has utilized RRPM (Resource Requirement Prediction Model) developed by the National Center for Higher Education Management Systems (NCHEMS), Boulder, Colorado. Using funds supplied by the EXXON Education Foundation, Azusa Pacific College adapted this computer model for use on a System/3 computer. The program, called RRPM/APC, is an enrollment driven cost simulation model that builds upon the ICLM (Induced Course Load Matrix) method of keeping track of students. Essentially, it follows the average student of a given level and major in the courses that he takes, assigns costs to those courses to provide reports of costs of degree majors, costs of courses by level in each discipline, etc. It does have the capability to analyze the cost and resource implications of alternative assumptions, curricula, courses of action, or degree programs.

The profile reports used most frequently at the planning level at our institution are the following:

1. RRPM computed productivity reports. For two or three comparative years reports by division: (a) credit hours produced; (b) percent of total credit hours; (c) unit cost; (d) FTE faculty; (e) productivity ratio.

2. RRPM computed projections on teaching faculty. For two or three year comparisons: (a) by rank; (b) by salary; (c) average FTE faculty salary; (d) average salary by rank; (e) FTE students per FTE faculty.

3. Fiscal projections on students based on fall semester. Three years comparison showing (a) number of students enrolled; (b) geographic origin of students; (c) typical academic year cost; (d) applications received, accepted, enrolled.

4. Comparative information from other Association of Independent California College and University (AICCU) Group IV Schools (10 in number) for three years. Comparative information on (a) expenditures (education and general, total); (b) personnel (full time, part time, administrative and staff support); (c) enrollment (fall semester); (d) selected faculty data.

5. Budget planning data with tables showing (a) numbers of classes by department displayed by enrollment, fall semester, two years; (b) faculty rank and tenure ratios, fall semester; (c) budget to credit hours produced ratios by department, fall semester, two years comparison; (d) budget analysis expenditures by department, two years comparison.

How Has It Worked?

Utilizing transactional data aggregated together to provide profile reports, and then putting profile material together to provide planning information provides a basis for informed planning. Several changes on our campus are directly traceable to this improved process:

1. Institutional planners have again been reminded of the centrality of the student to the enterprise. Since the computer simulation model is enrollment driven, planners must again confront the fact that it is the students taking courses offered by departments within degree programs who are really the institution's reason for existence.

2. The process of data collection and definition has altered and improved internal planning at all levels within the institution.

3. Faculty and department chairmen are continually reminded of the relationship between financial income through tuition dollars and curricula and course offerings. Department chairpersons are carefully scrutinizing low-enrollment courses that are not deemed critical to degree programs.

4. The driving force for planning is a concern for the demands and interests of students in degree programs and courses, not a concern for the wishes of individual departments and faculty members for offerings.

5. There has been an increased awareness at all levels of the concern to improve the productivity of faculty effort defined as the credit hours produced per FTE faculty. This has been demonstrated by some departments, adjusting course schedules and section loads to achieve a higher productivity average for the whole department.

6. New degree programs are being scrutinized carefully for all fiscal implications. A proposed new Master's degree program is currently being reviewed in regard to the RRPM computed costs and impact on the institution.

Information Sources

I am no more interested in preparing a vast annotated bibliography of all that has been written on management information systems in postsecondary education than you are in reading it. However, there have been a few sources that I have found particularly relevant and helpful as I have tried to sort out the wheat from the chaff in this area.

William A. Shoemaker presented a short and informative article describing some of the software available to help college managers do a better job in "Overview of Management Systems for Higher Education," *College Management*, April, 1974. Shoemaker's presentation outlines operating information systems, simulation models, procedural systems, and notes on implementation.

The Management Division of the Academy for Educational Development published a summary of the 1973 spring conference of the Society for College and University Planning. Entitled "Let's End the Confusion About Simulation Models," it defines "systems," provides illumination on problems of implementation, and describes a variety of applications.

Individual case study experiences are described in the NCHEMS (Boulder, Colorado) document entitled "Profiles of Management Information Uses" by Robert A. Huff and Michael E. Young. This May 1974 report describes how 12 institutions have utilized data from the NCHEMS Management Information System.

Planning and Management Practices in Higher Education: Promise or Dilemma is the proceedings of the national forum on new planning and management practices in higher education held at Denver in 1972. It presents a 200-page compilation of overviews, position papers, and a vast array of systems presentation abstracts.

A somewhat dated, yet nonetheless excellent, guidebook was prepared by Charles Pinnell for the Coordinating Board of the Texas College and University System. "Guidelines for Planning in Colleges and Universities" was published in five volumes by Texas A&M University in January, 1968. The volumes discuss the planning system, management and financial planning, and physical plant planning.

Finally, the series of leaflets entitled "Planning for Higher Education" published by the Society for College and University Planning, New York, in cooperation with Educational Facilities Laboratories of New York, provide timely information relative to various themes or topics appropriate to the presentation.

SPACE PLANNING: REPLACING MYTHS WITH FACTS

James R. Montgomery, Beatrice T. Mahan, and
Gerald W. McLaughlin
Virginia Polytechnic Institute and State University

Space planning is a must for large institutions and for all colleges and universities where space requirements approach space resources. One can scarcely enter this field before finding that even the simplest analysis requires an inordinate amount of time to collect the data. Many of the data requirements and the comparative figures derived from them have been generated for comparative purposes or for state-generated space allocation formulas (sometimes called guides, but the realist understands the true meaning as static requirements). In this paper, typical formulas and overview analyses are reviewed and a report is made of a useful planning procedure for the institutional level. The thesis of the paper is that the elaborate space planning procedures of the past are inefficient for the typical institutional research officer with scarce resources of time and budget, and that data are needed which have real meaning to the institution—not some other agency or group.

The space analysis procedures were first codified by John Dale Russell and James I. Doi (1957) in their *Manual for Studies of Space Utilization in Colleges and Universities*. The definitions, the collection procedures, and the formulas used make it the starting point for studying ways to analyze and to plan space utilization. Using simple yet intricate collection formats, Russell and Doi demonstrated how to obtain a useful analysis of space which, assuming other institutions followed similar patterns, could be used to compare space utilization. The following formulas represent a small portion of the outpouring which greets the reader of this manual (Russell & Doi, pp. 21-22).

1. Formula for *percentage of room-period use*:
   Assuming that the number of rooms available is 50 and the scheduled usage is 40 hours a week, there would be 50 x 40 or 2,000 room periods possible. If the rooms are used 1,000 hours a week, the room-period use would be 1000/40 or 25 hours. Dividing the room-period use by 40 (scheduled usage) yields the percentage of room-period use on a weekly basis.
2. Formula for *student hours per station:*

$$\frac{\text{weekly student-station-period use}}{\text{student-station size of room}}$$

3. Formula for *percentage of possible student-station-period use:*

$$\frac{\text{no. of room periods used x average size of class}}{\text{hrs. per week of usage x no. of student stations in room}} \text{ x } 100$$

Using these formulas it is possible to solve for the values which are derived when the data from the collection instruments for each room are combined. Figures 1 and 2 demonstrate this collection process.

The good space planner will utilize applicable material from Russell and Doi. The point which should be emphasized, however, is the need to obtain data which are really useful to management.

A direct descendant of the Russell and Doi classic work in space utilization is a study conducted by John X. Jamrich (1962) and reported in a publication of the Educational Facilities Laboratories, Inc., entitled *To Build or Not to Build*. The emphasis in this publication is on increasing the efficiency of use of existing space. A space utilization workbook is attached to this publication which enables an institution to obtain a clear picture of its use of instructional space.

A later consultant, Frederic Wood (Knowles, 1970), suggests that the most meaningful statistic for space measurement is room-period utilization. This measure can be used to review room-period use by a specific building or department, by days of the week, or by hours of the day. The basic form used by Wood, which one may see is a modification of Russell and Doi, appears in Figure 3.

In order to project space requirements, Wood (Knowles, p. 4-115) suggests using the Drexel method (which grew out of space projection study conducted at Drexel Institute of Technology under a grant from Educational Facilities Laboratories, Inc.). This method uses an institutional agency, for example, the registrar or academic dean, to project space for future needs by completing a form which shows:

	Sample Values
Size of course	450
Optimum section size	30
Maximum section size	40
Section meetings per week	3
Room utilization rate based on no. of hours rooms used on ave.	50%

From these data one may derive the following room needs for this course:

$$\frac{450}{30} = 15 \text{ x } 3 = 45 \text{ available hrs. each week for course}$$

If the room utilization rate is 50%, this room must be available 90 hours each week.

One then proceeds to build this projection by course, department, and college to find the total hours that rooms are needed. By dividing by the hours a week of room utilization, one derives number of rooms required. This system suffers from two problems: (1) it is no better than the person estimating the

Figure 1

SUMMARY OF INSTRUCTIONAL SPACE UTILIZATION BY HOURS OF THE DAY

____
Name of Institution

Form D

Summary of Instructional Space Utilization by Hours of the Day

(Data from Form A; use page for each kind of instructional rooms)

A. Kind of instructional rooms ______________________ total number of rooms ____________

B. Total available room-periods weekly at each hour:

1. Based on institutional's schedule (For each hour, enter in first column the number of rooms in category times number of days in the week classes may meet at that hour.)
2. Based on 44-period week (Enter in 2nd column.)
    - a. Morning hours (number of rooms in category times 6) ______________________
    - b. Afternoon hours (number of rooms in category times 5 ______________________

C. Total number of student-stations in this group of rooms ______________________

D. Total available student-station-periods weekly at each hour:

1. Based on institution's schedule (For each hour, enter in 3rd column number of student stations in category times number of days in the week classes may meet at that hour.)
2. Based on 44-period week (Enter in 4th column.)
    - a. Morning hours (number of student stations times 6) ______________________
    - b. Afternoon hours (number of student stations times 5) ______________________

Hour of Day	Total Available Room-Periods		Total Available Station-Periods		Total Room Periods Used	Total Student Station-Periods Occupied Weekly	Percentage of Possible Utilization			
							Room-Period Basis		Student-Station-Period Basis	
	Based on Instit. Schedule (1)	Based on Week of 44 Periods (2)	Based on Instit. Schedule (3)	Based on Week of 44 Periods (4)	(5)	(6)	Based on Instit. Schedule (7)	Based on Week of 44 Periods (8)	Based on Instit. Schedule (9)	Based on Week of 44 Periods (10)
7-8 A.M.		X		X				X		X
8-9										
9-10										
10-11										
11-12										
12-1 P.M.		X		X				X		X
1-2										
2-3										
3-4										
4-5										
5-6		X		X				X		X
6-7		X		X				X		X
7-8		X		X				X		X
8-9		X		X				X		X
9-10		X		X				X		X
10-11		X		X				X		X
11-12		X		X				X		X

(Russell and Doi, pp. 68-69)

Figure 2

PERCENTAGE DISTRIBUTION OF TOTAL ROOM PERIODS SCHEDULED FOR EACH HOUR OF THE DAY AND OF TOTAL STUDENT-STATION-PERIOD OCCUPANCY FOR EACH HOUR OF THE DAY

____
Name of Institution

FORM D-a (data from Form A)

Percentage Distribution of Total Room Periods Scheduled for Each Hour of the Day and of Total Student-Station-Period Occupancy for Each Hour of the Day

Kind of Instructional Rooms Involved ______________________

Hours Of the Day	Room-Period Use			Student-Station-Period Occupancy		
	Total Number at Each Hour	Percentage of Total		Total Number at Each Hour	Percentage of Total	
		At Each Hour	Cumulative		At Each Hour	Cumulative
7-8 A.M.						
8-9						
9-10						
10-11						
11-12						
12-1 P.M.						
1-2						
2-3						
3-4						
4-5						
5-6						
6-7						
7-8						
8-9						
9-10						
10-11						
11-12						
Total		100.0			100.0	

(Russell and Doi, p. 71)

Figure 3

SPACE UTILIZATION SURVEY FORM A

College . . . . Building . . . . Room . . . .

No. of Student Places: ( )a Sq. Ft. Area ( )b

Notes: . . . .

	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Total Occupancy	Total Periods
8 to 9								
9 to 10								
10 to 11								
11 to 12								
12 to 1								
1 to 2								
2 to 3								
3 to 4								
4 to 5								
5 to 6								
6 to 7								
7 to 8								
Total Occupancy								c
Total Periods								d

Percentage Periods out of 44: % e
Student Hours per Available Space: f
Percentage of Possible Student Occupancy: % g
Average Percentage of Student Occupancy per Period: % h

The Use of Form A

This is the basic form used for collecting the data for each room and provides the information used for subsequent forms.

Complete names of college and building and room reference number.

Capacity (box a) to be number of student places in the room.

Area (box b) to be in square feet measured inside the walls.

"Notes" to indicate use of room and whether it is a general-use room or has a limited or specialized use.

Complete form by inserting number of students in room for each period above the thin line and number of course below it.

Total the students and periods across lines and down columns, with grand totals in boxes c and d, respectively.

Keep forms for Special and General rooms separate throughout. Check totals and boxes c and d; then compute:

$$\text{Box e} = \frac{d \times 100}{44}$$

$$\text{Box f} = \frac{c}{a}$$

$$\text{Box g} = \frac{f \times 100}{44}$$

$$\text{Box h} = \frac{c \times 100}{d \times a}$$

Source: Wood, F. Space requirements for physical facilities. In A. Knowles (Ed.), *Handbook of College and University Administration*, New York: McGraw-Hill, 1970. Used with permission of McGraw-Hill Book Company.

course sizes, and (2) it is exceedingly slow because each initial projection must be entered by hand. The institutional researcher can bypass some of this procedure.

An approach, called the "Numeric Method," for determining space requirements is presented by Bareither and Schillinger (1968) in *University Space Planning*. As an illustration of the "Numeric Method" consider the index for the projection and analysis of classroom space. Bareither and Schillinger (p. 53) suggest using the following values to determine an index for the number of square feet per weekly student hour:

Square feet per student station	= 15
Hours per week classrooms are to be scheduled	= 30
Percent of time each station is to be occupied when the classroom is in use	= 60

$$15 + (30 \times .60) = .833$$

The value not obtained (.833) represents the amount of classroom space in square feet per weekly student hour that should be available. An important feature of the Numeric Method is its flexibility. If one wishes to use other values in the equation, there is no difficulty in determining a new index.

State coordinating councils, state governing boards, or other agencies have rushed fearlessly into space projections. Their efforts have resulted in comparisons among institutions and in formulas for calculating capital space needs. Typical of such development is the approach given by Halstead (1974). This approach derives an UI, which is the utilization index in assignable square feet (ASF) per weekly student hour (Halstead, pp. 432-33).

$$UI = \frac{A_s}{H_r \times P_s}$$

A_s = Station area in assignable square feet
H_r = Room use in hours scheduled per week
P_s = Station occupancy percentage for rooms used

If one had a classroom with 15 ASF per student station, which was used 30 class hours per week, with a 50% station occupancy, it would be possible to find the UI as follows:

$$UI = \frac{15}{30 \times .50} = 1.0$$

(One will note that this is the same procedure reported earlier as the Numeric Method of Bareither & Schillinger.) This measure allows, perhaps, comparisons among institutions. Certainly, one can determine whether classrooms are at 1.0 or another UI. The fact remains, however, for internal planning one does not know any more than previously; therefore, the good institutional researcher will not become entangled in such an analysis.

Sources to aid one to determine space utilization are available to an institutional researcher as evidenced by those which appear above. The question then becomes what type of data are actually needed to answer internal questions on utilization.

Faced with the need to determine whether a growing institution could house additional students until such time as a building program could catch up with the space demands and with the typical problem of limited time and money, it became necessary to cut across previous space utilization needs and ascertain whether students to be admitted could actually be scheduled in classes and the faculty to teach them placed in offices.

At this point in time the hours a classroom was used or the net assignable square feet per student station had little relevance; instead, the need existed to know how many more sections could be scheduled and how many more would need to be scheduled. Such a requirement led to developing a space utilization format along the following lines.

1. *Develop a Data Base for Projections:* First one projects the additional weekly contact hours which will be required for class and laboratories during the planning period, for example, five years. Starting with one of the traditional methods to predict enrollment, such as percentage increase, ratio, cohort survival or first degree curve, it is then possible to convert projections derived to instructional contact hours. The conversion to contact hours can be made by using historical ratios, differentiated by level, by college, or otherwise, or by using a cross-over matrix such as the induced course load matrix of NCHEMS.

Based on the faculty funding procedure used, the results from the enrollment projections can also be used to compute faculty requirements. The faculty requirements allow one to apply local ratios or formulas to obtain clerical, administrative, and other support staff requirements.

2. *Analyze the Use of Classroom and Laboratory Space:* Having obtained projections for students and faculty, one may now make appropriate assumptions and then begin to project space needs. One could assume, for example, that the status quo will continue and no new classroom space will be available. One should also address the question of whether average class size will remain constant and whether classroom space (rooms and student stations) will remain the same size. This study assumed a continuing enrollment increase for six years and no new academic buildings. The reader should bear in mind that these are rather sweeping assumptions and is invited to alter them based on prior experiences and institutional differences.

The next step is by far the most laborious in this or other space analysis because it is necessary to obtain a picture of space utilization. Regardless of whether one proceeds by hand or by computer, the material must be assembled one sec-

Table 1.

CLASS SIZE PROFILE BY TIME OF DAY[a]

Starting Time	Enrollment	Number of Sections	Average Class Size
8 AM	5,432	194	28
9 AM	5,751	213	27
10 AM	7,076	244	29
11 AM	5,994	222	27
12 N	4,350	145	30
1 PM	5,913	219	27
2 PM	5,500	250	22
3 PM	4,460	223	20
4 PM	2,496	156	16
5 PM	480	30	16
6 PM	132	12	11
7 PM	352	22	16
8 PM	300	20	15
9 PM	240	16	15

---

[a] Table 1 does not reflect actual data.

tion at a time. The analysis used disregarded student-station occupancy as an unnecessary factor (such data fluctuate by quarter and are most useful for those who want to be confused with data). Instead, it was only necessary to count sections at each hour and enrollment in them. From this one could then obtain average class size. These data appear in Table 1.

Standards can be established for the number of sections which should meet at given hours, and when these standards are met or exceeded one can assume that further expansion in sections will be met by extending the use of facilities later into the day. (While the number enrolled in a program may not be sufficiently large to support an "average" class, this is more a cause to review the frequency of offering specific classes in the program than to modify the standard.) An analysis of these data will indicate whether classroom contact hours can be absorbed into the existing scheduling procedures.

The results of the ICLM, for example, may indicate that an undergraduate major in history creates a load of 16 weekly contact hours in classrooms. If one assumes a class size of 25 to be the desired standard, then three new history students would be equivalent to adding two section hours to the week (3 x 16 / 25 = 2).

Requirements for general laboratories or seminar rooms can be found in the same manner using different standards for various disciplines. For example, if a freshman engineer were to create a load of 3 weekly contact hours in chemistry laboratory and if the general chemistry laboratories were to have 25 stations each with a standard of 20 students per section, then the addition of 40 freshmen engineers would require an increase of 6 section hours a week for chemistry laboratories.

Based on the existing utilization of instructional space, decisions can be made on the next steps. It may be possible to schedule more classes during the day; it may be necessary to extend scheduling into the evening.

Returning to the data, it may be observed in Table 1 that between 8 AM and 4 PM the number of sections range from 145 to 250 an hour. The researchers arbitrarily decided that 210 sections represented a target for optimum hourly scheduling. Even then the likelihood of building conflicts into the schedule has increased. Combining the FTE student projections by level and the data from Table 1, it was possible to obtain the results in Table 2.

Table 2.

ADDITIONAL SECTIONS NEEDED FOR ADDITIONAL FTE STUDENTS[a]

Year	FTE Under-Graduate	FTE Graduate	Additional Class Hrs/wk[b]	Additional Class Hrs/day	Additional Sections Needed/day[c]
1	700	100	13,800	2,760	110
2	500	170	11,040	2,208	88
3	325	300	9,450	1,890	76
4	260	270	7,920	1,584	63
5	120	250	5,160	1,032	41
6	80	175	3,540	708	28

---

[a] Table 2 does not reflect actual data.

[b] Using 18 contact hours for each additional FTE undergraduate student and 12 contact hours for each additional FTE graduate student, additional class hours per week were calculated.

[c] An average class size of 25 was used to determine the number of additional sections required.

Using an average class size of 25 and 210 sections per class hour as a local standard, it may be seen that the 8 AM, 12 N, and 4 PM class hours could handle 135 additional sections. Under these assumptions, the 110 additional sections required for Year 1 could be handled during the current 9-hour class day. By Year 2 the regular class day would have to be extended by at least one hour (135 − 110 = 25 additional sections that could be handled during the current 9-hour day, but a total of 88 additional sections are needed, which means that 63 sections would need to be added to the 5 PM time period which already has 30 sections). The 5 PM time period now would have 30 current sections, 63 added for Year 2, but could still accommodate 210 − (63 + 30) or 117 additional sections. Since only 76 additional sections are needed for Year 3, these can all be handled by the 5 PM time period. This leaves 117 − 76 or 41 sections that could still be added to the 5 PM time period. In Year 4, 63 additional sections are required, 41 of which can be added to the 5 PM period, with the remainder (22) being added to the 6 PM time period which only has 12 sections currently. One can see that the class day would not need to be extended further to accommodate the additional sections needed for Years 5 and 6 (22 + 12 + 41 + 28 = 103 which is less than the 210 standard). From this analysis one can see that by Year 2 the regular class day would have to be extended by at least one hour and by Year 4 by another hour. In actuality, the 6 PM starting period would probably need to be slipped to 7 PM or 7:30 PM to allow an evening break.

In evaluating the scheduling for laboratories, one should recall a study conducted by the California Coordinating Council for Higher Education (1971), which showed that in the California state colleges the percent station occupancy for classrooms dropped significantly after 5 PM, but only a slight decline occurred for class laboratories.

	Percent Station Occupancy 8 AM - 5 PM	5 PM - 10 PM
Classrooms	76%	61%
Lower Division Class Laboratories	86%	87%
Upper Division Class Laboratories	93%	90%

These findings seem to indicate that if additional classes must be scheduled for the evening hours it would be better to schedule laboratories rather than lectures.

3. *Reviewing Sole Proprietor Space:* The faculty and staff required to meet the increase in student enrollment generate office needs which might be considered on a sole proprietor basis. Here one should consider the amount of space needed by faculty, staff, graduate assistants, and others, for example, administrators.

In order to compute faculty space needs, the assumption can usually be made that faculty members will maintain the same average office sizes as currently exist. Needless to say, faculty office space varies on a campus frequently as a result of age of buildings. The procedure used to determine office space included the following steps:

The current average office size was calculated for the teaching faculty, the research faculty, and the extension and public service faculty. This calculation was made for the teaching faculty by dividing the teaching faculty office space in inventory by the number of allocated instructional positions. A

Table 3.

TOTAL OFFICE SPACE NEEDED TO MAINTAIN CURRENT LEVELS[a]

	Teaching Faculty		Research Faculty		Extension Faculty	
Year	Number Projected	Space Needed	Number Projected	Space Needed	Number Projected	Space Needed
1	427	72,590	123	20,910	75	13,500
2	444	75,480	128	21,760	78	14,040
3	459	78,030	132	22,440	81	14,580
4	473	80,410	136	23,120	83	14,940
5	484	82,280	139	23,630	85	15,300
6	492	83,640	142	24,140	87	15,660

[a] Table 3 does not reflect actual data.

similar calculation was made for the other two groups of faculty.

Using these three averages and the faculty projections, the total office space required to maintain current levels was determined.

In order to illustrate the procedure, assume the following values for average office size:

Teaching Faculty	170 sq. ft./FTE
Research Faculty	170 sq. ft./FTE
Extension & Public Service Faculty	180 sq. ft./FTE

Combining these values with faculty projections, total office space considerations can be determined as shown in Table 3.

The results in Table 3 indicate a need for an additional 11, 050 square feet for instructional faculty, 3,230 for research faculty, and 2,160 for extension faculty for a total of 16,440 net assignable square feet.

4. *Add Adjustments for Local Conditions:* One next makes refinements in the projections based on local knowledge and conditons.

a. The amount of new space coming into use or the fact that no additional space will be available should be considered.

b. Recognition of the latitude needed on the ideal number of students per section should be addressed.

c. Consideration should be given to the method of handling megasections (enrollments over several hundred) and television sections.

d. Since night classes traditionally have lower enrollments, consider what standards should be expected in them and how this affects faculty size.

5. *Results of Analysis:* The data now assembled allow administrators to identify and to approach several hard decisions. One may observe that these data suggest a university which faces a critical era caused by a failure of the state to provide sufficient space for growth. Several avenues of approach might be considered:

a. Develop a computerized space scheduling procedure to obtain the optimum use of available classrooms and laboratories.

b. Make a review of the following:

(1) Should the university accept the crowding conditions which must certainly develop?

(2) Should growth be curtailed?

(3) Should an all out effort be made to obtain space, for example, convert a dormitory to offices, obtain trailers for offices, build a temporary building, seek private financing for a new classroom and office building?

c. Study ways to increase section sizes, for example, through use of television or converting existing classrooms into larger lecture halls.

Summary

The current problem with traditional space analysis systems is that they focus on utilization of space by clock hours or another index. Net assignable square feet divided by student stations may be a statistic to use in negotiating for new buildings or for reviewing the number of student stations in a given room, but it is irrelevant in analyzing space uses in the institution concerned. One needs to instead look at where and when additional sections can be scheduled. Faculty and staff space requirements should be computed in the projections undertaken. The effect of adding students in certain curricula and the resulting space requirements should be analyzed.

Few institutions have sufficient space, nor will they have enough space in the foreseeable future. As long as enrollment expands or changes occur in the mix of students, on-campus analyses of space uses need to be undertaken.

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A PERFORMANCE INDEX FOR USE IN COMPARATIVE BUDGET ANALYSIS

John E. Stecklein
University of Minnesota

Despite expressed concern for the need to appraise product quality, efficiency is still the primary motivating force for the majority of the accountability advocates; and rightly so, in a large number of situations. Therefore, until some break through in measuring quality is reached, it seems appropriate to investigate all possible techniques for assessing efficiency and identifying the situations or conditions in which efficiency measures seem to be most feasible and useful.

From the field of physics, efficiency is defined as the ratio of output to input, where input and output are usually measured in equivalent units. In education, as in business, measures of input and output are usually very different things, and expressions of efficiency, instead of being stated in percentage terms, are usually expressed in terms of numbers of units produced per input unit. Typically, the measures of input are defined in dollar terms and the measures of output are expressed in terms of numbers of student-credit-hours, student-contact-hours, students served or graduated, etc. Although there are limitless possibilities for such measures, those most commonly used are probably student-credit-hours or student-contact-hours.

Usually the previously mentioned measures of input and output are combined and expressed as unit costs, i.e., efficiency is expressed indirectly (and inversely) in terms of the cost of producing a certain unit, for example, $25 per student-credit-hour. Such expressions are easy to understand and useful in budget allocation and planning, but they do not provide direct information regarding the relative efficiency of the input ingredients, e.g., faculty utilization, auxiliary instructional assistance, supplies and materials used, etc. Nor do they convey clearly whether unit cost differences are due to differences in input levels, instructional processes or procedures, output levels, or all three.

The two primary components of input into the operation of a department are the total dollar resources available to it (including faculty salaries) and the number of faculty members who are considered paid by or cross-charged to the department. But two departments with comparable dollar resources and FTE faculty may operate in a totally different fashion. How the department operates will determine the number of faculty members at given ranks, the ways in which faculty members spend their time, the number of courses offered, the use of secretarial staff and assistants, the size of classes taught, and the expenditures for supplies, equipment, and other departmental needs. Thus input for instruction is composed of dollar resources and faculty effort. In one department high ranking (or high salaried) faculty may be kept at a minimum; in another, nearly everyone will be at a top rank or salary level. In one department lower division courses may be taught by full professors; in another by teaching assistants or part time faculty. Therefore, the input of an instructional unit should be thought of *not only* in terms of dollar resources allocated to it, but in terms of how faculty effort is directed.

The purposes of this paper are: (a) to propose the very simple development and use of indexes to facilitate comparison of input and output elements for better understanding and easier interpretation of differences in these elements among like departments in similar institutions, and (b) to describe one combination of such input and output indexes into a composite index of efficiency which has been labeled the Performance Index (PI). The PI may be developed from inter-institutional comparisons of input and output elements and used in planning and making budgetary adjustments to reward efficient units or penalize inefficient units. The PI is intended for use in comparing like units in comparable institutions, such as similar departments, or in terms of classifications such as the PCS Discipline Categories developed by the National Center for Higher Education Management Systems (NCHEMS). The index approach would seem to have potential for use in comparing different departments within an institution, too, but that alternative is beyond the scope of this paper.

Although various input measures may be used, and in different forms,[1] the measures used in this article will be restricted to the total dollar allocation for a given department (excluding equipment) and Full Time Equivalent (FTE) faculty effort devoted to instructional activities in that department. Similarly, output may be expressed in many units, but will be restricted to student-class-hours produced by that department in the examples presented.[2] Real data collected from several similar institutions will be used to show the development of comparative indexes for each measure of input, for the output measure, and for the three measures combined. Separate data will be utilized for lower division, upper division, and graduate division courses to illustrate differences.

Such comparative Performance Indexes, readily interpretable by administrators, should provide useful information for management decision-making regarding instructional budget allocations. An example of how such comparative indexes could be used in making supplementary budget allocations for instructional purposes will also be presented. Possible dangers and pitfalls involved in the use of Performance Indexes to adjust budget allocations will be discussed.

Input and Output Indexes

The process of developing indexes is very simple. One collects data of a given type in exactly the same form from a number of institutions. A reference point is then established, depending upon the nature of the comparison desired. If an administrator wants to compare the total dollar expenditures for lower division instruction in his English department with the similar total dollar expenditures in English departments in other institutions of the same type, he may use the figures for his department as the reference point. If an administrator for a system wants to compare total dollar expenditures for instruction in English departments in all institutions in the system, he might use the mean or median (or minimum!) expenditure as the reference point. The comparative index is obtained by dividing each of the expenditure figures into the reference figure. Thus the reference point will have an index of 1.00. If a department has an index of 1.25, that means that that department has spent 25% more than the reference figure for instruction. An index of .87 indicates that that department spent only 87% as much as the reference department.

The Performance Index

The same procedure can be followed to develop indexes for any measure of input, such as Full Time Equivalent (FTE) faculty, or for various measures of output. Such indexes are indicated in Table 1 for a given college or department (say Education).[3] The table shows the number of Student Class Hours produced by the given unit in each institution, the total dollar expenditures for instruction at each level—lower division, upper division, and graduate—the FTE faculty time devoted to instruction at each level, the Input and Output Indexes determined by comparing each measure to the Median for that measure, and the composite index—the Performance Index (PI)—which relates the two input measure indexes to the output index. The PI is the ratio of the output index to the average of the two input indexes. Figure 1 compares the PIs for the several institutions graphically, and against the Median Performance Index.

A scrutiny of the figures in Table 1 shows that the unit in institution C (Output Index of 1.17) produced 17% more lower division student class hours than the median, but worked with more than twice as much money (Index of 2.08) and put nearly twice (Index of 1.97) as much faculty time into instruction as the median. The effects of these disparities in input and output are reflected in the Performance Index (.58), which shows that the unit in institution C is only about half as efficient, over all, as the median institution (PI of 1.00). In contrast, institution C's unit is slightly above average in performance at the graduate level (PI = 1.09). At this level it produced more than twice the median number of student class hours (Output Index = 2.12), using 81% more dollars than the median figure (Index = 1.81), and slightly more than twice the faculty effort (Index of 2.11). The comparisons are shown graphically, for each instructional level, in Figure 1.

Use of Performance Index for Budgetary Adjustment

The Performance Indexes may be applied directly to

Table 1:

BASIC OUTPUT AND INPUT DATA FOR USE IN COMPUTING THE PERFORMANCE INDEX FOR THE FIELD OF EDUCATION, IN SELECTED COMPARABLE INSTITUTIONS, USING THE MEDIAN AS A REFERENCE POINT

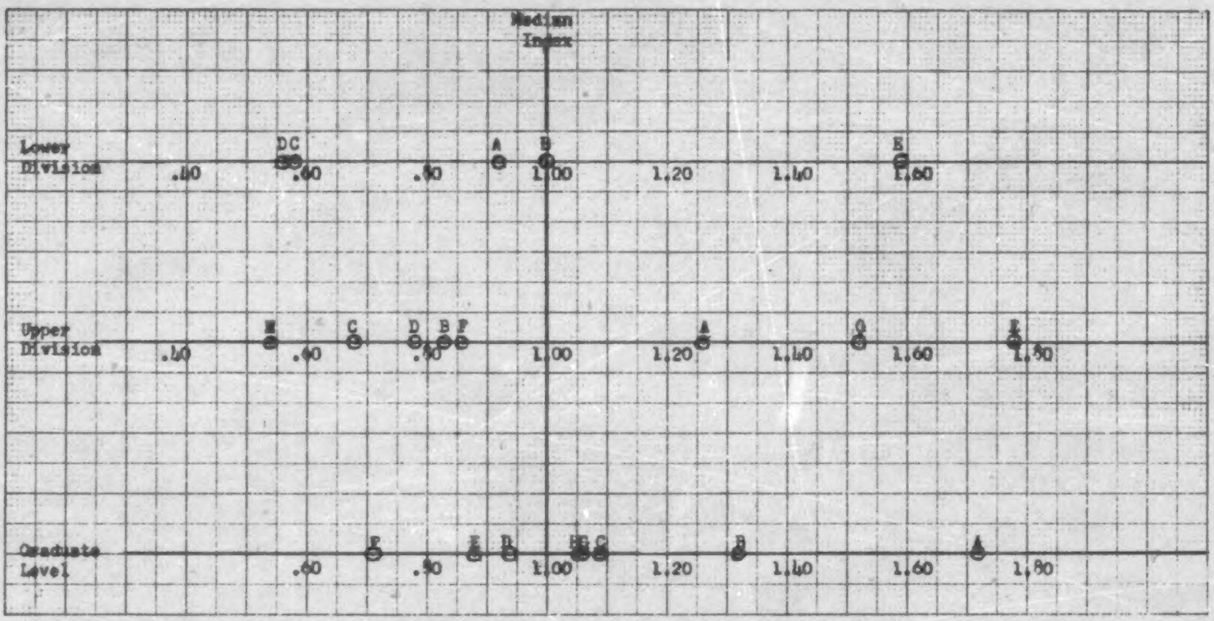
	Student Class Hours		Total Dept'l Expenditures (excl. equipment)		Full Time Equivalent Teaching Staff		Performance
Lower Division	Sch	Output Index	Dollars	Input Index A	FTE	Input Index B	Index[a]
Institution A	4893	.85	27,122	.93	4.42	.93	.92
Institution B	5738	1.00	29,234	1.00	4.76	1.00	1.00
Institution C	6718	1.17	60,859	2.08	9.38	1.97	.58
Institution D	8230	1.43	82,462	2.82	11.07	2.32	.56
Institution E	3948	.69	11,363	.39	2.28	.48	1.59
Median	5738	1.00	29,234	1.00	4.76	1.00	1.00
Upper Division							
Institution A	16,935	1.46	128,796	1.11	20.77	1.20	1.26
Institution B	13,139	1.13	158,643	1.36	23.36	1.35	.83
Institution C	10,129	.87	153,382	1.32	21.55	1.24	.68
Institution D	14,472	1.24	202,594	1.74	24.99	1.44	.78
Institution E	16,654	1.43	103,502	.89	12.07	.70	1.78
Institution F	5274	.45	58,429	.50	9.35	.54	.86
Institution G	9323	.80	67,354	.58	8.28	.48	1.52
Institution H	5224	.45	100,097	.86	13.85	.80	.54
Median	11,634	1.00	116,149	1.00	17.31	1.00	1.00
Grad School							
Institution A	5845	2.19	65,936	1.15	8.48	1.38	1.72
Institution B	2379	.89	41,206	.72	3.89	.63	1.32
Institution C	5635	2.12	103,788	1.81	12.98	2.11	1.09
Institution D	2949	1.11	5[illegible],648	1.04	8.09	1.32	.94
Institution E	1924	.72	5[illegible],265	.96	4.20	.68	.88
Institution F	1467	.55	[illegible]9,284	.86	4.18	.68	.71
Institution G	4856	1.82	105,434	1.84	9.82	1.60	1.06
Institution H	1016	.38	18,381	.32	2.43	.40	1.05
Median	2664	1.00	57,456	1.00	6.14	1.00	1.00

[a] $$\text{Performance Index} = \frac{\text{Output Index}}{1/2\ (\text{Input Index A} + \text{Input Index B})}$$

Figure 1

PERFORMANCE INDEXES FOR VARIOUS COLLEGES, UPPER DIVISION, LOWER DIVISION, AND GRADUATE LEVEL

(Performance Index = ratio of Index of Student Class Hours produced to Average of Indexes, of FTE Faculty Devoted to Instruction and Total Dollar Allocation to Instruction—excluding equipment)



the budget allocation process as a means of rewarding and penalizing departments for efficient or inefficient use of resources. That is, the Indexes may be applied to budgeting allocation techniques of certain types. The procedure for applying them to a budgetary process based on unit cost data will be described in this section. The technique should work with other budgetary procedures, but some adjustments will probably be necessary in the interpretation of the PIs as they are applied.

If unit cost data are used to allocate dollars, some basic number representing the anticipated output—enrollments, student credit hours, student class hours, etc.—is needed for budgeting purposes. In the example shown in Table 2, the increase or decrease in number of student credit hours has been predicted for each level of instruction. The PI can be used to adjust the dollar allocations that would customarily be indicated if the increase or decrease in number of student credit hours was simply multiplied by the costs per student credit hour for the given level of instruction. When the PI is applied, however, the dollar amount produced by multiplying the unit cost by the anticipated increase or decrease in student credit hours is in turn multiplied by the PI if an increase in output is indicated. For an expected *decrease* in output, the *difference* between the PI and 2.00 is used in order to adjust appropriately for above or below average efficiency. This step is necessary when output decreases are expected, because it does not make sense to cause an extra increase in reduction of dollar support for an efficient operation or cause a decrease in the support less than dictated by unit costs for an inefficient operation.

A detailed explanation of one or two lines of data from Table 2 will clarify the process just described. Listed in Table 2 are the predicted unweighted student credit hour increases or decreases for the various units in Institution C, by level of instruction. Listed in the second set of columns are the unit costs per student credit hour, also by level of instruction. The third set of columns shows, by instructional level, the Performance Indexes determined by comparing the respective instructional units (college divisions or departments) in Institution C with like units in other comparable institutions. The PIs were determined for each unit in the same way as those discussed in Table 1. In each instance, the median is being used as a Performance Index reference point, with a value of 1.00. Thus, a PI greater than 1.00 indicates a unit with a performance rating above the median, and a PI lower than 1.00 indicates a unit that is not performing up to the level of a median unit in terms of efficiency.

The fourth set of columns shows the dollar allocations that would be made to each unit after the dollar amounts have been adjusted according to the Performance Index. For Education, for example, an increase of 939 student credit hours is expected at the lower division level. This number is multiplied by $9.06 per student credit hour to arrive at a dollar allocation of $8507, before adjustment for comparative performance. The $8507 is then multiplied by the PI of .58 to obtain an allocation of $4934 for the expected increase in student credit hours at the lower division level. The PIs are applied in similar fashion for

Table 2:
ANTICIPATED CHANGES IN STUDENT CREDIT HOUR LOADS, UNIT COSTS, PERFORMANCE INDEXES, AND DOLLAR ALLOCATIONS TO HANDLE CHANGES IN STUDENT LOAD, BY LOWER DIVISION, UPPER DIVISION AND GRADUATE LEVEL

	Predicted Increases or Decreases in Student Credit Hour Load			Unit Costs Stud. Cr Hr.			Median Index = 1.00			Dollar Allocation for Enrollment Increases or Decreases				
Instructional Units	**L.D**	**U.D**	**Grad**	**L.D**	**U.D**	**Grad**	**L.D**	**U.D**	**Grad**	**L.D**	**U.D**	**Grad**	**Total**	**Per Cent**
Agriculture	− 3441	4718	90	$ 5.54	$ 7.60	$11.28	.92	1.26	1.72	$− 20,588	$45,180	$ 1,746	$26,338	15
Business	− 166	2390	132	5.09	12.07	17.32	1.00	.83	1.32	− 845	23,943	3,018	26,116	15
Education	939	1023	509	9.06	15.14	18.41	.58	.68	1.09	4,934	10,532	10,214	25,680	15
Engineering	5079	2499	− 562	10.02	13.99	20.22	.56	.78	.94	28,499	27,270	− 12,045	43,724	25
Liberal Arts	4439	2327	− 280	2.88	6.21	28.72	1.59	1.78	.88	20,327	25,722	7,077	53,126	30
													174,984	100%

the figures for Education for the upper division and graduate levels of instruction to obtain allocations of $10,532 and $10,214, respectively. Added together, the Education unit would be allotted $25,680 to take care of anticipated increases over their current budget.

In contrast, the Agriculture unit is expecting a decrease of 3441 student credit hours produced in the coming year at the lower division level. When this number is multiplied by the unit cost figure of $5.54, a decrease in dollar allocation of $19,063 is obtained. However, the Agriculture unit is below the median in performance at this level, so the dollar allocation should be adjusted to take the PI of .92 into account. If one simply multiplied the dollar amount by .92, the result would be a reduction of the dollar loss—a bonus, whereas a penalty should be applied. It is therefore necessary to subtract .92 from 2.00 to effect a slight increase in the dollar loss due to the drop in student credit hour output. Multiplying the $19,063 figure by 1.08 results in a decrease in dollar allocation for instruction at the lower division level of $20,588. Combining this decrease with the increases entitled at the upper division and graduate levels due to anticipated increases in output, adjusted for higher than median performance, results in a net increase of $26,338 for Agriculture as a whole unit. Calculations for the other units were made in the same fashion. If a specific dollar amount has been set aside or appropriated for increases in student load, the allocations derived in the fashion described above may be totaled, and the percentages of that total represented by the dollar allocations for each unit may be applied against the total appropriated, to utilize the total appropriation. Or, the remainder may be used for discretionary allotments to adjust for unusual circumstances.

The reader might ask why the adjustment indexes are not applied to the dollar allocation needed to take care of the total number of student credit hours anticipated for an instructional unit rather than to just the increase or decrease in number. Such an application can, of course, be made. The impact of such a sudden adjustment could be traumatic, however, or create severe administrative problems. By adjusting only for changes, the effect is more gradual and, if continued for a period of years, should effect an overall change in efficiency which is administratively feasible.

Obviously, the PI should not be used to adjust budgets mechanically. Knowledge of special conditions, e.g., offering of new courses, changes in scheduling, elimination of requirements and so on, that may effect class size should be taken into account, as should restrictions on faculty assignments such as special duties, heavy tenure, etc. Of course, the comparability of the comparison units should be carefully weighed before developing the PIs.

Summary

The use of indexes can facilitate the understanding of sources and amounts of variations contributing to efficient operation of instructional programs. By converting input and output measures to indexes using median indexes as reference points, the input and output levels for a given instructional unit may be easily compared with input and output levels for like units in similar institutions. The separate input and output indexes may in turn be combined into a composite index of efficiency—labeled a Performance Index (PI)—by dividing the output index by the average of the input indexes. The Performance Index is useful for interinstitutional comparisons and may be used in making budgetary adjustments to reward efficient operation.

In the example described in this study, measures of input were total dollar expenditures for instruction (excluding equipment, but including salary allocations of both professional and non-professional personnel, materials and supplies, etc., utilized in instructional activities), and the Full Time Equivalent faculty time devoted to instruction. The output measure was the number of student class hours produced. Other measures for either input or output may be used in computing indexes.

Whatever reference point is used, its index will be 1.00. The other indexes will then vary below or above 1.00, indicating less or more efficiency than the reference point. The indexes may then be used to adjust budgetary allocation to reward efficient units or to penalize inefficient units, if desired.

Although the procedure has been applied to only one set of measures of input and output in this report, the possibilities of using indexes with various measures of input and output appear limitless. Much more experimentation with the use of indexes in making budgetary allocations would be desirable, particularly an assessment of the long-term effects of such a "reward and penalize" system upon departmental practices. Unfortunately, the development of such interinstitutional comparative indexes is dependent upon the continued, uniform collection of basic input and output data by institutions of comparable type. Because of this need, the potential use of Performance Indexes for interinstitutional comparisons seems greatest in unified or coordinated systems of higher education.

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[1] Beatty, Gulko and Sheehan propose the use of seven data elements—a measure of instructional offerings, a measure of student instructional activity, average relative faculty effort, FTE faculty, total faculty compensation expense, expense for instructional support, and non-instructional academic department expenses—in their Instructional Cost Index procedure.

[2] Student class hours are used instead of student-contact-hours to convey the idea that the contact is restricted to regularly scheduled classes and does not include informal or unscheduled contacts. However, such inclusion might be very appropriate in certain situations, e.g., in institutions with graduate programs, for more refined analysis, if such data are available.

[3] If the PCS Discipline Categories differ for a given department among the institutions, comparisons should be limited only to the Discipline Categories that are common to all institutions being compared. Of course the comparisons can be based only on Discipline Categories instead of departments, but since budget allocations and staff assignments are typically made by colleges and departments, it is more useful to compare departmental units.

Beatty, G., Jr., Gulko, W. W., & Sheehan, B. S. The *instructional cost index*. Boston: University of Massachusetts, July 1974.

FORMULA FUNDING OF HIGHER EDUCATION IN THE UNITED STATES: AN OVERVIEW OF THE STATE-OF-THE-ART

Francis M. Gross, The University of Tennessee at Martin

The great increase in the budgetary requirements of higher education during the last two decades has resulted in a corresponding increase in the growth rate of state appropriations for public colleges and universities. As more state resources have been channeled into postsecondary education each year, budget agencies and legislatures in many states have become acutely aware of the need for a systematic and objective approach for exercising greater control over public funds for higher education. On the other hand, college and university administrators are determined to protect academic freedom from the encroachment of budgetary restraint. One logical compromise has been the development and deployment of budget formulas to determine the appropriation request or allocation of state funds for the operating budgets of state-supported institutions of higher learning.

Extent of Budget Formula Utilization

A doctoral dissertation completed by the author in 1973 (Gross, 1973) surveyed each state to identify the existing budget formulas currently in use. Twenty-five states were found to be utilizing budget formulas[1] in justifying requests for the 1974-75 or 1974-76 operating budgets of state-supported collegiate institutions. The extent to which each budget formula was used in calculating the appropriation request for each of the eight functional budget areas (instruction and departmental research, organized activities related to instruction, libraries, general administration and general expense, student services, organized research, extension and public service, and physical plant operation and maintenance) generally recognized by most colleges and universities is presented in Table 1. Whereas the budget formulas in use were all different, very detailed, and quite complicated, a summary of their general characteristics follows:

1. Budget formulas in 21 states (Alabama, Arkansas, Colorado, Florida, Georgia, Louisiana, Maryland, Mississippi, Nevada, New Jersey, North Dakota, Ohio, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Virginia, Washington, and West Virginia) were applied statewide. The Minnesota formula was applied only to the state colleges and excluded the University of Minnesota system. The formula used in New York applied only to the City University of New York system; the State University of New York system used guidelines. In Oklahoma two institutions were not funded under the regular formula; instead, their allocations were determined by a new program/formula budget system being pilot-tested. The Wisconsin formula was used only for the University of Wisconsin system.

2. A majority of the budget formulas was used for developing or justifying operating budget requests. Only four states (Florida, Louisiana, Mississippi, and Oklahoma) appeared to have actually used formulas for allocating lump-sum appropriations from their legislatures among institutions.

3. Two separate budgeting techniques were found to be in use: *Zero-base budgeting* (where the operating budget is developed anew each year and justified by objective or subjective data) was practiced by 23 formula states, and *incremental budgeting* (where the previous year's operating budget becomes the base to which additional requests—justified by objective or subjective data—are added) was practiced by two formula states—New York and Wisconsin.[2]

4. Formula components followed two separate approaches in calculating the funding requirements for budget areas. The *all-inclusive* approach (where the total amount for one or more budget areas is determined through one calculation) was used in 58% of the formula components, and the *itemized* approach (where the amount for one or more budget areas is the sum of several separate calculations, e.g., professional salaries, nonprofessional salaries, departmental expenses, etc.) was used in 42% of the formula components. Table 2 presents the number of components in which each formula approach was used.

5. Many budget formulas differentiated among academic areas and student or instructional levels. (See Table 2.) Sensitivity to these factors was most prevalent in the calculation of the estimated funding requirements for instruction and departmental research, where 14 states differentiated among academic areas and 23 states differentiated among student or instructional levels. Ten states (Alabama, Arkansas, Colorado, Florida, Louisiana, South Carolina, South Dakota, Tennessee, Texas, and Wisconsin) used budget formulas which differentiated among both factors.

6. A majority of the formula states used budget formulas which differentiated among institutions or types of institutions. Seven states (Florida, Minnesota, Ohio, Pennsylvania, Virginia, Washington, and West Virginia) specified (or allowed each institution to specify) different formula factors (e.g., rates, percentages, or ratios) for individual institutions. Twelve states (Colorado, Florida, Louisiana, Maryland, Mississippi, Missouri, Nevada, New Jersey, North Dakota, Oklahoma, South Carolina, and South Dakota) differentiated among types of institutions (e.g., colleges, specialized schools, regional universities, and comprehensive research universities) by specifying different formula factors. (See Table 2.)

7. Three basic computational methods were identified under which every formula calculation can be classified. They were: (a) the *rate per base factor unit* (RBFU) method; (b) the *percentage of base factor* (PBF) method; and (c) the *base factor-position ratio with salary rates* (BF-PR/SR) method. A summary of the number of states using each method by budget area is presented in Table 3. The RFBU method was used in

Table 1

FORMULA CALCULATION OF FUNCTIONAL BUDGET AREAS IN TWENTY-FIVE STATES

State	Instruction and Departmental Research	Activities Related to Instruction	Libraries	General Adminis-tration and Expense	Student Services	Organized Research	Extension and Public Service	Physical Plant Operation and Maintenance
Alabama	F		F	F	F			F
Arkansas	P^a		F	P^b	F			P^c
Colorado	P^d		F					
Florida	F		F	F	F		P^e	F
Georgia	F		F	F	F		F	F
Louisiana	F	F	F	F	F	F	F	F
Maryland	P^a		F	F	F			F
Minnesota	P^f		F					P^g
Mississippi	F		F	F	F	F		F
Missouri*	F							
Nevada	F		F	F	F			F
New Jersey	F	F	F	F	F		P^e	F
New York**	F		F	F	F			
North Dakota	F	F	F	F	F			F
Ohio	F	F	F	F	F			F
Oklahoma	F	F	F	F	F	F	F	F
Pennsylvania	F	F	F	F	F			F
South Carolina	F	F	F	F	F		F	F
South Dakota	P^d							
Tennessee	F		F	F	F			F
Texas	F		F	P^b	F	F		P^c
Virginia	P^h		F					P^i
Washington	P^i		F		F			F
West Virginia	P^j		P^k					
Wisconsin	F		F		F			
Totals	25	7	23	17	19	4	6	19

Key: F = Fully recognized by formula component.
P = Partially recognized by formula component which included:

[a] Faculty Salaries Only
[b] General Administration Only
[c] Building Maintenance and Custodial Service Only
[d] Faculty, Academic Administration, and Supporting Salaries Only
[e] Public Service Only
[f] Faculty and Supporting Salaries Only
[g] Building Maintenance Positions, Custodial Positions, and Utility and Fuel Cost Only
[h] Faculty and Academic Administrative Salaries Only
[i] Total FTE Positions and Operating Expenses Only
[j] Faculty Salaries, Supporting Salaries, and Operating Expenses Only
[k] Personnel Salaries Only

*The Governor's formula.

**The City University of New York formula.

Table 2

SUMMARY OF BUDGET AREAS RECOGNIZED, FORMULA APPROACHES, AND AREAS OF SENSITIVITY OF FORMULAS IN TWENTY-FIVE STATES BY INDIVIDUAL BUDGET AREA

	Recognized by Formula		Formula Approach			Differentiation	
Functional Budget Areas	Included as Formula Components	Separate Formula Components	All Inclusive	Itemized	Academic Areas	Student or Instructional Levels	Among Institutions
Instruction and departmental research	25	25	4	21	14	23	16
Organized activities related to instruction	7	3	3			1	2
Libraries	23	22	11	10	6	10	5
General administration and general expense	17	17	15	2	1	2	2
Student services	19	8	8			1	2
Organized research	4	3	3				1
Extension and public service	6	4	3	1			2
Physical plant operation and maintenance	19	18	10	8		1	6

Table 3

SUMMARY OF FORMULA METHODS USED BY BUDGET AREA IN TWENTY-FIVE STATES

Budget Areas	Formula Methods		
	RBFU	PBF	BF-PR/SR
Instruction and departmental research	13	10	17
Organized activities related to instruction	1	2	
Libraries	12	16	8
General administration and general expense	8	11	1
Student services	6	2	1
Organized research		3	[illegible]
Extension and public service	2	2	[illegible]
Physical plant operation and maintenance	11	11	4

Where: RBFU is the rate per base factor unit method.
PBF is the percentage of base factor method.
BF-PR/SR is the base factor-position ratio with salary rates method.

37% of the calculations and was the primary method used in estimating funds for student services. The PBF method was used in 40% of the calculations and was the primary method used in estimating funds for organized activities related to instruction, libraries, general administration and general expense, and organized research. The RBFU and PBF methods were used equally in calculating the estimated funds for plant operation and maintenance. The BF-PR/SR method was used in 23% of the calculations and was the primary method used in estimating funds for instruction and departmental research.

8. A geographical distribution of formula and non-formula states indicated that formula funding was most prevalent in the Southeast (where 10 out of 12 states used budget formulas), the Mideast (where 4 out of 5 states used budget formulas), and the Great Plains region (where 4 out of 7 states used budget formulas). The states in the Southwest (four) and Far West (four) were evenly divided on formula and non-formula usage, while only a minority of the Great Lakes (two out of five) and Rocky Mountain (one out of five) states used budget formulas. The New England states (six), as well as those outside the continental U.S. (two), did not use budget formulas. Twelve of the 14 Southern Regional Education Board (SREB) member states used budget formulas.

9. Three states (Maryland, New Jersey, and Ohio) were using formulas designed to complement program/formula budgeting systems centered around the development of expenditure models (a) based on historical expenditure records, (b) program-oriented, and (c) applied on a formula basis.

Generalizations Concerning Budget Formula Utilization

Based on the extent of budget formula utilization in 1973 and the characteristics of the individual formulas, the following generalizations and conclusions are offered:

1. Budget formulas are most likely to be used and accepted in those states which spend relatively less on higher education—the reason being that formula funding at least assures institutions of higher education of a minimum foundation of state support on an equalized basis among colleges, regional universities, and comprehensive universities.

2. Budget formulas have been used predominately in calculating the estimated funding requirements for those budget areas in which data related to expenditures were most easily quantifiable (e.g., the budget areas of instruction and departmental research, libraries, general administration and general expense, and student services were based directly or indirectly on projected FTE enrollments; and physical plant operation and maintenance was based on square feet of building space, building replacement cost, and campus acreage).

3. The incremental technique to budgeting does not lend itself to formula funding because it removes the base budget (last year's operating expenses) from objective determination or justification. Zero-base budgeting, on the other hand, goes well with formula funding in that the entire operating budget is developed anew each year on the basis of the objective data.

4. The all-inclusive approach for estimating funding requirements for each budget area is less detailed and may be more easily understood by legislators, educators, and the general public. However, its use restricts the number of base factors (which serve as indicators for estimating resource requirements) and may result in a budget request that bears little resemblance to actual needs (e.g., to base total library funding requirements only on projected FTE enrollments fails to take into consideration existing library collection deficiencies resulting from inadequate funding in the past). Conversely, the itemized approach may result in a budget formula which is quite complicated (and may not be widely understood), but it does add greater refinement and accuracy to a formula by permitting a broader base for resource requirement predictions.

5. The comparative analysis of formula components used in each state in estimating funding requirements for instruction and departmental research (which constitutes approximately 60 to 70% of most operating budgets) revealed two philosophies toward the financing of higher education. Eight states which used formulas on a statewide basis (Alabama, Arkansas, Florida, Georgia, Nevada, Tennessee, Texas, and Virginia) made no distinction among institutions or types of institutions when allocating funds for instructional programs. Instead, they differentiated among instructional levels and/or academic areas. This reflected an "equalization" policy in funding higher education which has the potential for a "leveling" effect upon the quality of instruction, because the leading colleges and universities (which most often have higher educational costs due to higher salary scales that are necessary to attract and hold distinguished professors) will be underfunded. The chances for attaining mediocrity are enhanced further if the state deducts the estimated unrestricted revenue (which includes income from student tuition and fees, federal and local appropriations, sales and services of educational departments, organized educational activities, recovery of indirect costs, separately budgeted research, interest from invested unrestricted funds, rents, and royalties) of each institution from its formula—calculated budget request in arriving at the state appropriation. This restricts the capstone institutions further by limiting their operating budgets to a formula-prescribed amount that may be supplmented only by their endowment income and current restricted contributions.

In contrast, the remaining 13 states which applied formulas on a statewide basis (Colorado, Louisiana, Maryland, Mississippi, Missouri, New Jersey, North Dakota, Ohio, Pennsylvania, South Carolina, South Dakota, Washington, and West Virginia) differentiated among institutions or types of institutions as well as instructional levels and/or academic areas. This policy recognized the diversity of instructional costs and institutional differences, and reflected the commitment of many states to establish and/or maintain one or more outstanding institutions of higher learning.[3]

6. The vast differences which existed among individual institutions and among individual state systems of higher education preclude the development of a "model formula." Each formula found to be in use in 1973 was designed for the system of higher education to which it applied, and each formula had shortcomings that might be more pronounced if applied in another state.

Recommendations for Developing and Applying Budget Formulas

As a result of the comprehensive study of budget formula usage in 1973, certain recommendations and guidelines are offered to states contemplating the future development and utilization of budget formulas:

1. The decision to develop and utilize budget formulas should be made only after all alternatives have been fully identified and evaluated. Each state must decide, based on its own situation, whether or not the advantages of formula funding outweight the disadvantages. On the positive side of the ledger, the advantages were perceived to be:

a. Budget formulas can be developed which estimate the funding requirements for most of the functional budget areas of college and university operation based on objective (quantitative) data.

b. Budget formulas have the potential for reducing the bickering and open competition among institutions for state funds which may occur in the absence of any other rational, objective means for allocating funds.

c. Budget formulas have the potential for assuring each institution of an annual operating base appropriation—assuming that the legislature accepts the formula and that the base factors (e.g., FTE enrollments) do not decrease.

d. Budget formulas provide state officials with a reasonably simple and understandable basis for deciding upon and presenting the financial requirements of higher education.

e. Budget formulas represent a compromise between state control over line-item budgeting and institutional fiscal autonomy.

On the negative side, the disadvantages of formula funding were perceived to be:

a. Budget formulas do not recognize quality. This limitation will exist until the means for quantifying and measuring quality of instruction, research, and public service is developed.

b. A budget formula is limited in its ability to estimate adequately the funding requirements for a given budget area by how well the formula (fixed) factors represent reality and the extent to which the base (variable) factors have a positive correlation to historical expenditures.

c. Budget formulas, if used on an equalization basis, have a great potential for a "leveling" effect upon the quality of education. Whereas the educational programs in low-quality institutions may be improved through the increased funding realized when similar programs (e.g., the same instructional levels within the same academic areas) are funded at rates based on statewide average historical costs, it may be at the expense of the high-quality programs at the leading colleges and universities.

d. Budget formulas have the potential for restricting the operating budgets of institutions by requiring the deduction of all unrestricted revenue in arriving at the state appropriation, by precluding the distirbution of surplus state revenue to higher education, and by using a narrow base which does not adequately predict resource requirements.

e. Budget formulas may perpetuate inadequate operating appropriations if the base or formula factors are selected on the basis of their existence at a point in time.

f. Budget formulas, through their reliance upon base and formula factors, historical costs, and arbitrary assumptions, are an enticement for institutions to increase enrollments in specific categories, or otherwise manipulate data in order to maximize their incomes.

2. The development of a budget formula should be performed by a task force consisting of the financial representatives from the state budget office, the higher education coordinating or governing agency, and from every institution to be affected. The task force should be given ample time and resources for conducting an intensive study of various funding approaches and formulas being used in other states. The task force should continue to exist as long as formula funding is practiced in order to perform periodic studies concerning the validity of the formula and to make recommendations for its revision, modification, or termination.

3. Budget formulas should be utilized only for calculating the funding requirements of those budget areas for which exist base factors with a high correlation to their historical expenditures. The base factors recommended for consideration in each budget area are:

Budget Areas	Base Factors
Instruction and departmental research	Projected FTE enrollments or credit hours
Organized activities related to instruction	Projected FTE enrollments or instructional budget
Libraries	Projected FET enrollments or instructional budget and collection deficiencies
General administration (GA) and general expense (GE)	Projected FTE enrollments and the total educational and general budget and (excluding GA and GE)
Student services	Projected FTE enrollments or instructional budget
Organized research	Research cost-sharing
Extension and public service	Continuing education units and instructional budget
Physical plant operation and maintenance	Square feet of building space, building replacement cost, or campus acreage

In calculating the budget or allocation for instruction and departmental research, the formula should recognize the varying costs of instruction by differentiating among levels of instruction within each academic area at each institution.

4. Budget formulas *should not* be used for the "equalization" of institutions unless mediocrity of educational

programs is the desired goal. Instead, formula funding should serve as a minimum foundation for higher education, and the actual state appropriation for each institution *should not* be reduced by unrestricted revenue from the sale of educational services, federal or local governments, or from any source except student tuition and fees. This would provide for the improvement of low-quality programs without jeopardizing the leading "centers of excellence" in academe or without destroying their initiative for self-improvement through increased nonstate revenue.

5. There should always be the provision for an institution to override the formula-calculated amount in its operating request with an additional request supported by both objective and subjective data.

Budget Formula Performance Standards

Budget formulas should be evaluated in light of performance criteria designed to reflect standards of acceptability. One set offered for consideration consists of ten criteria which represents the goals, objectives, and ideals most commonly expressed in the literature on funding higher education. Each criterion was reviewed and rated by a review panel consisting of nine educators distinguished by their contributions to and interest in the field of higher educational finance.[4] In rank order of importance (as determined by the panel), these criteria are:

1. A budget formula should lend itself to clarity for and comprehension by all parties concerned, as shown by its straightforward construction which clearly demonstrates the relationship between fixed and variable components.

2. A budget formula should be designed to accommodate the dynamic nature of higher education, as evidenced by its flexible design and its provision for the periodic change of fixed inputs and/or revisions.

3. A budget formula should not be used for the detailed control of expenditures, as demonstrated by its being applicable only for justifying budget requests of or allocating funds to colleges and universities, and for limited internal budgeting between functional areas, discipline areas, and levels of instruction.

4. A budget formula should recognize the diverse financial needs of institutions, as indicated by its sensitivity to the mission, role, institutional complexity, location, and any other factors which serve to differentiate among the financial requirements of individual colleges and universities.

5. A budget formula should provide for the equitable treatment of all institutions of like types, as evidenced by its capability for treating data on similar programs in a uniform and comparable manner.

6. A budget formula should be broad-based and addressed to the total financial operating needs (exclusive of auxiliary services) of institutions, as shown by its recognition of the individual functional areas of operation and, where appropriate, should utilize quantitative data directly related to the financial requirements of each functional area to be funded.

7. A budget formula should take into account the varying costs of instruction, as demonstrated by its recognition of the varying funding requirements for individual disciplies as well as levels of instruction.

8. A budget formula should be objective, as indicated by its utilization of quantitative data in determining the financial needs of colleges and universities.

9. A budget formula should promote efficiency and economy in operation, as indicated by its ability to facilitate comparisons among similar institutions and programs on a state, regional, or national level.

10. A budget formula should recognize the qualitative efforts of individual institutions, as demonstrated by its built-in incentives of additional funds for the successful completion or pre-stated institutionally-defined goals and objectives.

In conclusion, a formula must be evaluated on its own merit; or how well, in an equitable and objective manner, it serves to predict the financial resource requirements of the individual institutions subject to its applicability—without destroying their initiative, flexibility, and diversity.

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[1] A budget formula is defined as a set of statements which detail a procedure for manipulating variable data (base factors) applicable to an institution of higher education by pre-established fixed data (formula factors) to produce the estimated future funding requirements of the institution. A budget formula may consist of several sub-sections or components (i.e., separate formulae for each functional budget area) and may be expressed algebraically.

[2] According to the literature received from each state, the incremental approach appeared to be predominant in the non-formula states.

[3] The other formula states were evenly divided: the Oklahoma and Wisconsin formulas differentiated among institutions, while the Minnesota and New York formulas did not.

[4] The review panel consisted of Robert O. Berdahl, M.M. Chambers, Edward J. Coyle, James Furman, Lyman Glenny, Adolph Koenig, John D. Millet, Bevington Reed, and Logan Wilson.

Gross, M. A comparative analysis of the existing budget formulas used for justifying budget requests or allocating funds for the operating expenses of state-supported colleges and universities. Unpublished Doctoral dissertation, The University of Tennessee, 1973.

SOME EXAMPLES OF COST-BENEFITS AND COST-EFFECTIVENESS ANALYSES IN THE PLANNING OF HIGHER EDUCATION INSTITUTIONS IN PORTUGAL

J.J.R. Fraústo da Silva, Maria Emília Freire, and
J.P. Martins Barata,
Universidade Nova de Lisboa, Portugal

Introduction

Planning of higher education has, in recent years, assumed an important role in the context of both general educational planning and economic planning in Portugal.

As in many other developing countries with scarce resources, pronounced needs in the several social sectors and lack of correspondence of the educational system to the needs of the society, a strong need for adequate instruments for rational allocation of resources was felt at the several decision levels.

The existence of the Bureau for Research and Planning of Education within the Ministry of Education with close connections with the Prime Minister's Office for General Planning was a favorable asset for the undertaking of the necessary studies.

On the other hand, the relations established with the Organization for Economic Cooperation and Development (O.E.C.D.) at various levels and for several activities, not only allowed a better acquaintance of the technical staff of that Office with modern planning techniques, but have also influenced government representatives who became more receptive to those techniques and to new ideas which originated or were discussed within that international organization.

Most of the work which is now carried out in our university, the New University of Lisbon, originated in the Bureau of Research and Planning where the present authors have worked for a few years, and in the field of Higher Education in general.

The most relevant research studies were on (a) manpower forecasting according to the goals of the economic development plan; (b) the forecasting of social demand for the several levels and degrees in Higher Education; (c) the efficiency of the educational system; (d) the costs and rentability of the public investment in the several levels of the educational system on an economic basis; (e) the location of several new institutions of Higher Education.

At the institutional level, studies on (f) the location of the campus of the New University of Lisbon; (g) the construction of its facilities; (h) the implementation of its information system (Management Information System); (i) the developing of simulation and optimization models for resource allocation; and (j) the introduction of Program Budgeting have also been undertaken and their conclusions currently adopted.

In many of these projects evaluation techniques such as cost-benefits analysis (CBA) and Cost-Effectiveness Analyses (CEA) were used.

The purpose of this paper is to present and discuss two examples of the application of both CBA and CEA to educational investment as related to the reform of the Portuguese system of higher education.

The two examples chosen are the study of the rentability of the educational system in Portugal involving a cost-benefit approach and the study on the location of the new institutions of higher education by means of cost-effectiveness analysis.

I — Study on the rentability of educational investment in higher education

This study was performed to compare the rentability of the investment in higher education with the rentability of the investment in the other educational levels by taking into account the efficiency of the system as a measure of the "risk" of the investment.

The initial elements needed for the analysis are the benefits (financial) and costs associated to each educational level.

The benefits were considered to be: (1) the average income expected by each holder of a certain degree or level of education during his normal active life (taking into account the average salary differential received in the labor market in comparison to a non-graduate); (2) the expected average income taking into account the probabilities of success and failure and the expected time spent at school before entering the labor force.

The expected incomes defined in (2) are always lower than those defined in (1), since they are dependent on the efficiency of the system to "produce" graduates in the normal period of time.

On the cost side a similar distinction was made: (1) the expected average cost to be supported by society if the student gets his degree in the minimum period of time, (2) the expected average cost to be supported if the expected rates of failure or success, and average time spent at school to get the degree or the average time to leave without degree are taken into account.

The costs defined by (2) are always higher than those defined by (1) since the higher the probability of remaining at school without getting the degree, the higher the costs. Both (1) and (2) include the typical items of social costs: teaching expenditures, salaries, equipment and buildings depreciation, as well as the opportunity costs including the earnings foregone for the students not being paid or not contributing to the economy while they are at school.

The earnings foregone included in the total costs of each educational level were considered to be the earnings received by a person in the next lower level. The earnings corresponding to each educational degree were calculated from a function relating salaries to the years of formal schooling, established with data provided by the official statistical services. The results of the econometric tests supported the hypothesis on the value of total earnings expected by each graduate during his active life.

The indicators of efficiency of the educational system were obtained by studying the educational system by means of a Markov-chain model. Probabilities of finishing or leaving before receiving each degree as well as the average time expected for finishing or leaving the system were derived from the model using data for 1972. They provided useful information on the efficiency of the system and were used in our cost-benefit analysis as a measure of the "risk" of the investment.

The results are presented in *Table* 1. Column (1) presents the general indexes of wastage or inefficiency which were calculated as a combination of the probability of fair lure to receive the degree and the surplus of time expected to be spent at school relative to the normal time in which the degree could be obtained. Column (2) gives the probability of a student entering the educational system at a certain level to obtain the degree corresponding to that level. Columns (3) and (4) give the results for the internal rates of return obtained for different educational levels using the average terms for costs and benefits or using the risk of the investment included in the wastage indexes. The results presented in column (3) were obtained from the equation:

$$\int C_t \cdot e^{(\gamma - r)t}\,dt - \int E_t \cdot e^{(\theta - r)t}\,dt = 0$$

where C_t and E_t are the costs and the benefits associated with each educational level, γ and θ the rate of growth of the costs and benefits over time, r the internal rate of return and t the time.

The results presented in column (4) correspond to the results of the analysis taking into account the probabilities of success or failure, and the average time spent at school to get the degree and for leaving without getting it. The results show the different rates of return calculated by the equation

$$\alpha^{*}\int C_t \cdot e^{(\gamma - r)t}\,dt + \beta \int C_t \cdot e^{(\gamma - r)t}\,dt$$

$$- \beta \int E_t \cdot e^{(\theta - r)t}\,dt = 0$$

where β is the probability of finishing the degree, α the probability of leaving without it, n^{*}_{β} the average time to finish the degree, n^{*}_{α} the expected average time of remaining in school before leaving without the degree.

The results presented in Table 1 enable us to derive several conclusions concerning the efficiency of the system of higher education in Portugal and the rentability of the investment the society currently does in this social sector. This will be performed at two levels: analyzing the rentability of the investment (1) in itself, and (2) relative to the other educational levels.

When we look at the efficiency of the higher education level in itself, some aspects seem noteworthy. First of all the inefficiency index being equal to 2.6 means that the cost of a graduate equals 2.6 times the normal cost that would be borne if the system worked in optimal conditions. This result derives on one hand from the low probability one student entering the first year has of getting the degree (just 56.7% —column 2), and on the other hand from the surplus of time the student spends at school compared to the normal time expected in optimal conditions, — e.g. without repetitions (49.2%).

The internal rate of return, the most usual indicator on the rentability of the investment, reflects these conditions as shown in the two last columns; if the system worked efficiently, the internal rate of return would be of 14.3% —which is considered high when compared with the normal 10% of public investment projects—against the 6% obtained for the present conditions of efficiency, by taking into account repeaters, drop-outs and so on.

Comparison of higher education with other educational levels also gives some interesting indications of the relative efficiency of the system. The existence of different educational levels, all competing for public funds, requires this kind of comparison which permits the ranking of different programs.

Our findings showed that higher education is one of the most inefficient levels in terms of achievement and wastage of student time. The difference between the results obtained for the internal rates of return including or excluding the efficiency parameter are conclusive of the importance of this kind of information.

The results for the internal rate of return for the system in its optimal state showed that higher education is, even so, less rentable than primary education, although among the post-primary levels of education its results are the best. If one compares the same rates taking risk into account, the conclusions are much less favorable. Higher education reflects, in this latter case, the poor conditions in the system, not only in comparison with the other educational levels, but also far

Table 1

EFFICIENCY INDICATORS OF THE EDUCATIONAL SYSTEM FOR SIX LEVELS AND INTERNAL RATE OF RETURN WITHOUT AND WITH EFFICIENCY PARAMETERS

Educational level	Inefficiency index	Probability of achievement	Rate of return no risk	with risk
	1	2	3	4
Primary educational	1.7	79.3%	37.19%	30.91%
Preparatory Cycle	1.4	84.2%	57.12%	38.48%
General High School	2.1	60.1%	13.39%	6.02%
Complementary High School	1.3	95.1%	13.72%	7.71%
Vocational post-secondary School	2.8	57.5%	11.06%	2.35%
Higher Education	2.6	56.7%	14.31%	6.00%

below the normal 10% internal rate of return accepted for public investment programs.

Another remark should be made. It concerns the very low result obtained for what we have called post-secondary vocational education, which once again derives not only from a very low efficiency caused by the high wastage and considerable surplus of time the student spends at school, but also from the relatively low salaries the graduates with this educational level usually receive, due to the lack of social prestige of this degree.

If these results are used to propose policy measures for public funds allocation, it is obvious that they indicate that funds should be allocated to compulsory education; only if the efficiency increases the rate of return should higher education be considered.

But it is equally obvious that the results cannot be taken too literally and without any other considerations or criteria. Besides the increasing social demand for this level of education, there are a number of factors to be considered, not only those generally associated with higher education, such as promotion of culture and science, but also the non-quantifiable secondary economic effects, not readily apparent in the value of the rate of return on the investment. The final decision taken was indeed to expand and diversify the system and to try to improve its efficiency.

II — Location of new institutions of higher education — the new Universities

The second example, given to illustrate the application of cost-effectiveness analysis to evaluating projects of educational investment, is one which followed the governmental decision to expand the system of higher education.

In 1973 four university centers existed on the Portuguese mainland, one of which, Coimbra, is the eleventh oldest university in Europe. Overcrowding and obsolescence led to the need to consider the creation of new centers of higher education and to reformulate the aims and structures of this level of studies. The rate of return of the investment in higher education was known to be unfavourable if the efficiency of the system were not increased. Proposals were made whereby full-fledged universities and short-term higher educational institutions (Polytechnics and Schools of Education), would form a network covering the territory. Two main goals were to be reached (1) to expand and improve the general standard of higher education and research, and (2) to compensate for the geographical and social inequalities derived from the Portuguese urban network.

The guidelines of this proposal, involving political and territorial components as well as purely academic ones, were:

— to benefit the poorly endowed regions by granting them Polytechnics and Schools of Education, thereby giving their populations better opportunities of reaching higher educational levels, and at the same time providing those regions with technical skills and trained teachers they badly lack.

— to locate the universities wherever the conditions for their development would be shown to be most convenient and their effect most pronounced irrespective of regional labor requisites. These latter conditions are acceptable given the small size of the country and the growing mobility of the most qualified manpower.

To enable the Government to make a reasonably rational choice of locations for the new universities, two sets of criteria were tested and their results superimposed.

The first set led to an ordering of the objective conditions offered by the several cities of Portugal to support university institutions, using as criteria the transport facilities and road network, commercial and social structures, housing capacities, climate and building conditions, cultural liveliness and so on.

The second led to the ranking of the prospective cities according to their potential to attract student population. This potential was evaluated by the application of the simple gravitational model relating the distribution of the high school students throughout the territory, to the attraction exerted by each prospective location.

This model was of the form

$$D_i = K\beta_i \sum_j \frac{P_j}{d_{ij}}$$

where D_i was the total intake of students to be expected at the ith university center, K the observed rate of students leaving high school to those entering university level, P_j the number of high school students at each jth location d_{ij} the distance between each jth location and the prospective university location and β_i a parameter peculiar to each university.

Data were available from past years to test the model retrospectively, and to calibrate it by trying several values of K and β_i. A remarkable fit was obtained. It was found, moreover, that along with the normal gravitational "pull", the best fit was obtained when β_i represented the size of the teaching staff, which is related to the total number of students, thus reflecting an intrinsic "quality" index or parameter.

By repeated computer runs, introducing variable clusters of prospective new locations in addition to the three already existing ones, and with variable "quality" parameters it was clearly shown that some locations would have a small effect in terms of student's "pull" and were successively discarded.

By comparison of the orderings obtained by the aforementioned criteria, the cities of Lisbon, Braga and Aveiro were chosen for the new Universities. It was understood that the location in Lisbon meant a new university in the metropolitan area of Lisbon, and not a simple expansion of the two universities already existing within the city.

Once decisions were taken at the governmental level by the end of 1973, confirming the proposals of the planning team, University Boards and Presidents were appointed for the new institutions.

It is interesting to trace the development of one of these institutions, the New University of Lisbon, which constitutes a further example of application of cost-effectiveness analysis for evaluation of a project and which was carried out by the same team of planners.

The first step taken by the newly appointed University Board was to secure the cooperation of the

County of Lisbon Planning Authority (Gabinete do Plano da Regiao de Lisboa), obtaining from it the indication of about twenty possible sites within the Area.

At the same time, the Planning Authority explained its wishes for the expected effects of the University on the planning scheme. They can be summarized in the following themes:

— the University should not add to the congestion of the regional core; its location should be chosen so that beneficial effects on urban social life could be felt and, if possible also in the zones outside the core country of Lisbon less well equipped in cultural assets of any kind.

These wishes very well suited those of the University Board. The problem, then, was to choose the sites, pitting a set of conditions established by the University against the conditions offered by each of the prospective sites.

For each location a set of quantifiable values was determined:

1 — Land prices
2 — Possible site acreage
3 — Generated traffic on the existing transportation network
4 — Student accessibility from the Metropolitan Area
5 — Existing housing capacity and a set of non-quantifiable values:
6 — Quality of site for building purposes
7 — Estimated time needed for juridical and administrative procedures leading to the aquisition of land (buying, expropriation, rehousing of displaced households, etc.)
8 — Possible effects on the cultural and social life of surrounding communities.

Thus, striving to comply with the Planning Authority recommendations, to obtain the smallest overall cost to the University, to be able to begin in a short time the planning of the building development, to obtain the best student accessibility, and to provide for the equipment of poorly endowed sectors of the Metropolitan Area, a choice was made by the following procedure.

At each stage, every possible location was examined, as exemplified in Figure 1.

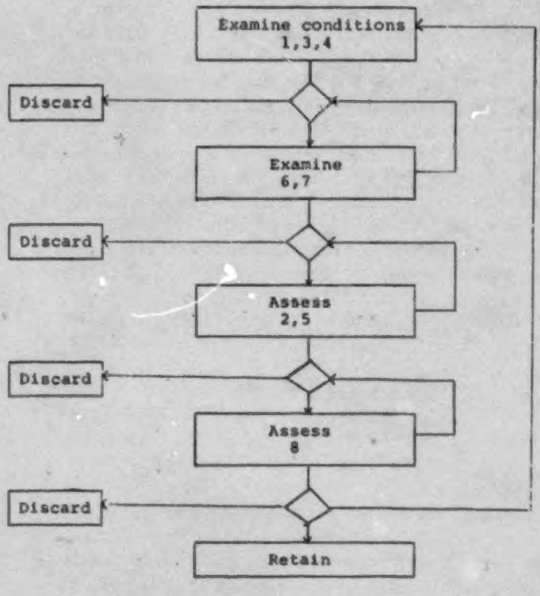
Traffic generated in each location was obtained from a simulation model used by the Planning Authority. Student accessibility was studied on the assumption that the distribution of prospective students was similar to the overall geographic distribution of populations in the Metropolitan Area, irrespective of the flow of students to the two already existing universities in the Metropolitan core country. This is a reasonable assumption given the small scale of the Metropolitan Area. Land prices were taken as the latest market commonly known land prices in each zone.

Difficulties in land acquisition were estimated by experts in the inevitable juridical and administrative loop-holes associated with real-estate operations, according to the state of land use and actual occupation, the numbers of individual pieces of property, and planning compromises already existing.

Other values were assessed according to the results of local inspection, inquiries and sociological interpretation, and discussion of known population behavior based on previous planning experience of urban planners and sociologists.

Figure 1

FLOW CHART USED TO SELECT THE MOST CONVENIENT SITE FOR THE NEW UNIVERSITY OF LISBON



As a result, the final choice was a location on a stretch of land in the southern bank of the River Tejo, facing the city of Lisbon which is undergoing a process of planning for a whole new residential town. The University will now be the center of this planning operation, and the staff involved is working closely with the University's planning team, in order to achieve a good blending of the academic and urban environments.

The main goals are, at the moment, to ensure a scheme that allows for the growth of the University buildings according to a master-plan which seeks to embrace the surrounding urban developments, to secure at the same time the common use of some amenities and facilities (green spaces, transportation facilities, libraries and auditoria, etc.) and providing for spacious reserves for University growth.

Final remarks

Two examples were given involving the use of cost-benefit and cost-effectiveness analyses for the evaluation of projects in the field of higher education in Portugal.

In the first case, the study of the rentability of educational investment in Portugal, the cost-benefit analysis may be used, and has actually been used assess the profitability of investment on a comparative basis, between different levels of education. One obvious result is the need for reconsideration of the policies on post-secondary vocational education, where the combined effects of low efficiency and low prospective incomes for the graduates, causes an abnormally low rate of return. These institutions are to be given a higher status and will function effectively as short-cycle institutions granting B.A. degrees equivalent to those of the Universities.

As to the other levels, the analyses show that a major effort should be made to eliminate illiteracy, since the general basic education is by far the most rentable investment of all the possible ones.

What cannot be done is to decrease the investment in education and, for the purposes of the present study, the investment in higher education, merely because the rate of return is low when compared with the normal rate of interest of public investment in Portugal. These are many other non-quantifiable factors which cannot be considered in a cost-benefit analysis, such as the individual and social spill-over effects of education, which are of primary relevance for the decision-makers.

It is obvious that something has to be done to reduce the high inefficiency index which is the main reason for the low rates of return observed (see Table 1). Various policy measures will have to be adopted to improve the situation by facing the factors which are causing the inefficiencies. This is not to say the investment should not be considered because the rate of return is low. Here we see the limitations of this evaluation technique when applied to the social sectors, for most of the "benefits" cannot really be included in the analyses.

The second example given, the location of the new Universities in Portugal and of the site for the New University of Lisbon, is one to which multiple cost-effectiveness analysis had to be applied. Typically one was faced with different costs and different effectivenesses, a situation where minimization of cost-effectiveness ratios makes no sense. For the location of the three Universities the simultaneous consideration of the two criteria described was easy and it may be said that the solution arrived at is one of ensuring maximum effectiveness at approximately the same cost. However, for the location of the campus of the New University of Lisbon, different costs were found for situations which were not quite similar in their effectiveness, and the solution adopted was not necessarily that corresponding to the lower cost nor to any kind of minimum cost-effectiveness ratios.

It ought to be added that although many factors were considered in this study, others were not included, although some have been kept in mind and certainly pondered over at the decision level. We refer particularly to the political impact of the decisions on the regions which were or were not favored by the results. As in many other countries, rivalry between cities or regions frequently creates political malaise and this is certainly a factor to be taken into consideration however difficult it may be to give it a proper weight.

In our case the proposal of locating the three new Universities near the coast of the country was met with some criticism as it was the fact that one of them was not located in the capital city of the district.

Now, the location of the Universities near the coast is an unavoidable decision, because that is where the people will be living (probably 80% of the entire population of Portugal in 10-25 years). Whether this is the result of inadequate economic policies of the past it is another matter, but given the present situation, to use universities to promote economic development or act as motors for economic development by locating them in regions which lack the necessary basic infrastructures would be a tremendous mistake; there are many examples around the world to demonstrate that universities result from and follow development rather than promote it just by their presence.

In this case the decision was rightly taken although "political reasons" have hindered the location of one of the institutions (University of Minho) in the capital city of the province due to its closeness to another important and rival city, which wishes to be considered for at least some schools.

Political reasoning also led the educational authorities to select Evora (a city in the interior of Portugal) as a fourth University center, although that was not indicated in the planning studies. Strong regional motivations, closeness to Spanish University towns, the existence in the past of a university in the same city and other factors led the authorities to a "political" decision, although a prudent and less ambitious one.

It may be argued that reasoning of this nature can also be included in the evaluation of the "effectiveness" of projects using techniques such as Delphi, or to choose between alternative solutions, but it is doubtful if that will indeed constitute an improvement as far as the task of the planners go. On the contrary, it may result in a more difficult understanding between planners and politicians.

Our experience of educational planning in Portugal has been a satisfactory one: direct reporting to the Minister of Education and easy contact with the Prime Minister's Office for overall planning helped to reconcile the more "technical" and the more "political" decisions and we feel that the optimal decisions have been taken by those to whom that responsibility had been commited.

PROGRAM COST ANALYSIS BY SIMULATION

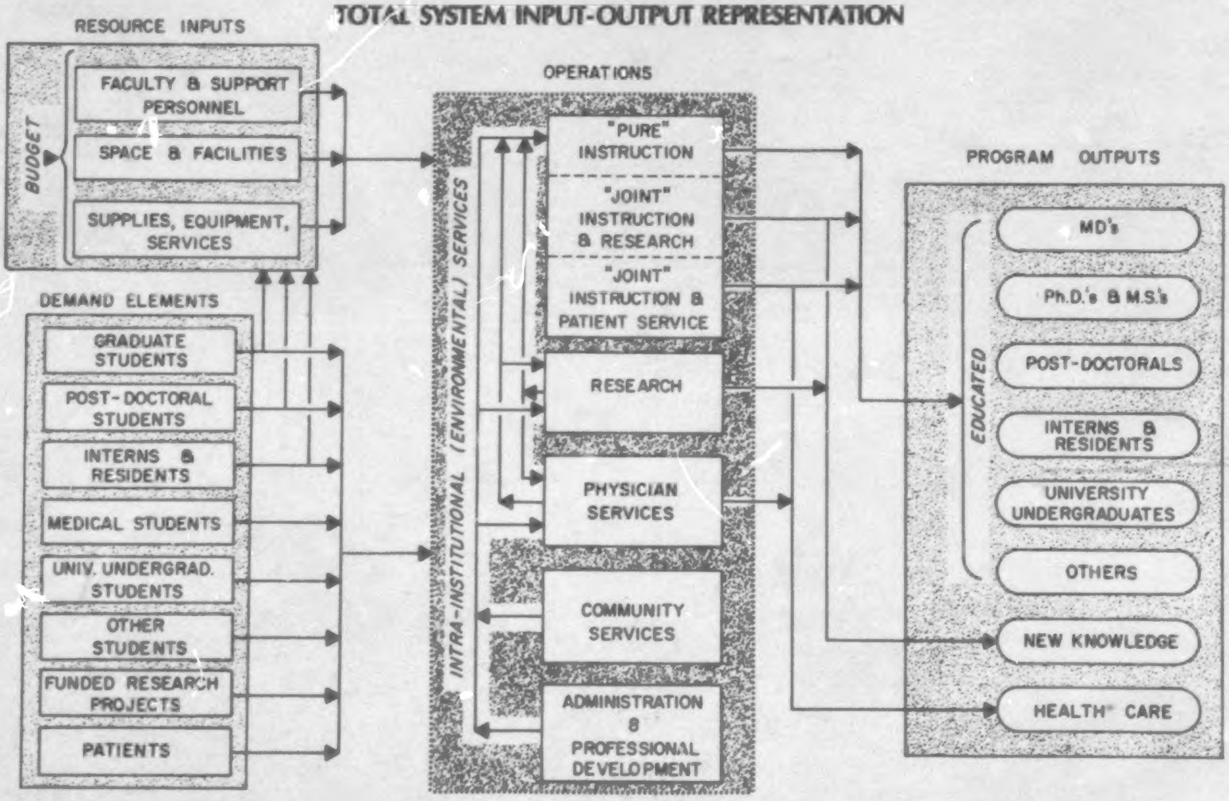
Kenneth L. Kutina
Case Western Reserve University

Decision-making in educational institutions concerning various proposed programmatic changes (i.e., in levels of enrollment of students in various degree tracks, curricula content and length, or faculty activity patterns) should be analyzed on the basis of expected *changes in benefits* versus expected *changes in cost*. Such cost changes which are functions of operating changes are termed incremental costs. In schools of medicine substantial program cost allocation work has been done under the auspices of the Association of American Medical Colleges (1971) and the Institute of Medicine (1974). These efforts have contributed significantly to the standardization of program costing methodology and definitions and have done much to heighten the level of awareness of the usefulness of such self-analysis. However, the utility of conventional program cost allocation is severely limited for internal planning and decision-making purposes because it produces *average* program costs based on a given set of operating conditions and related to a fixed slice of time. These procedures yield little information about incremental program costs.

The estimation of incremental costs in an academic health center is a non-trivial task because if one attempted to alter programs on the basis of a designed experiment in order to determine their associated incremental costs, either disaster for the analyst or institution would most likely result or the process would take so long that resulting information would not be available in time to effect relevant decisions. Probably the best tool available to deal with this problem is simulation modeling, whereby a mathematical representation of the operating and financial characteristics of the institution is contrived and utilized for such analysis. Such a model, termed POPS for Program Oriented Planning System (Kutina & Lee, 1974) has been developed and implemented at Case Western Reserve

Figure 1

TOTAL SYSTEM INPUT-OUTPUT REPRESENTATION


RESOURCE INPUTS
BUDGET
FACULTY & SUPPORT PERSONNEL
SPACE & FACILITIES
SUPPLIES, EQUIPMENT, SERVICES
DEMAND ELEMENTS
GRADUATE STUDENTS
POST-DOCTORAL STUDENTS
INTERNS & RESIDENTS
MEDICAL STUDENTS
UNIV. UNDERGRAD. STUDENTS
OTHER STUDENTS
FUNDED RESEARCH PROJECTS
PATIENTS
OPERATIONS
INTRA-INSTITUTIONAL (ENVIRONMENTAL) SERVICES
"PURE" INSTRUCTION
"JOINT" INSTRUCTION & RESEARCH
"JOINT" INSTRUCTION & PATIENT SERVICE
RESEARCH
PHYSICIAN SERVICES
COMMUNITY SERVICES
ADMINISTRATION & PROFESSIONAL DEVELOPMENT
PROGRAM OUTPUTS
EDUCATED
MD's
Ph.D.'s & M.S.'s
POST-DOCTORALS
INTERNS & RESIDENTS
UNIVERSITY UNDERGRADUATES
OTHERS
NEW KNOWLEDGE
HEALTH CARE

University (CWRU). It is described briefly in the next section of this paper.

POPS

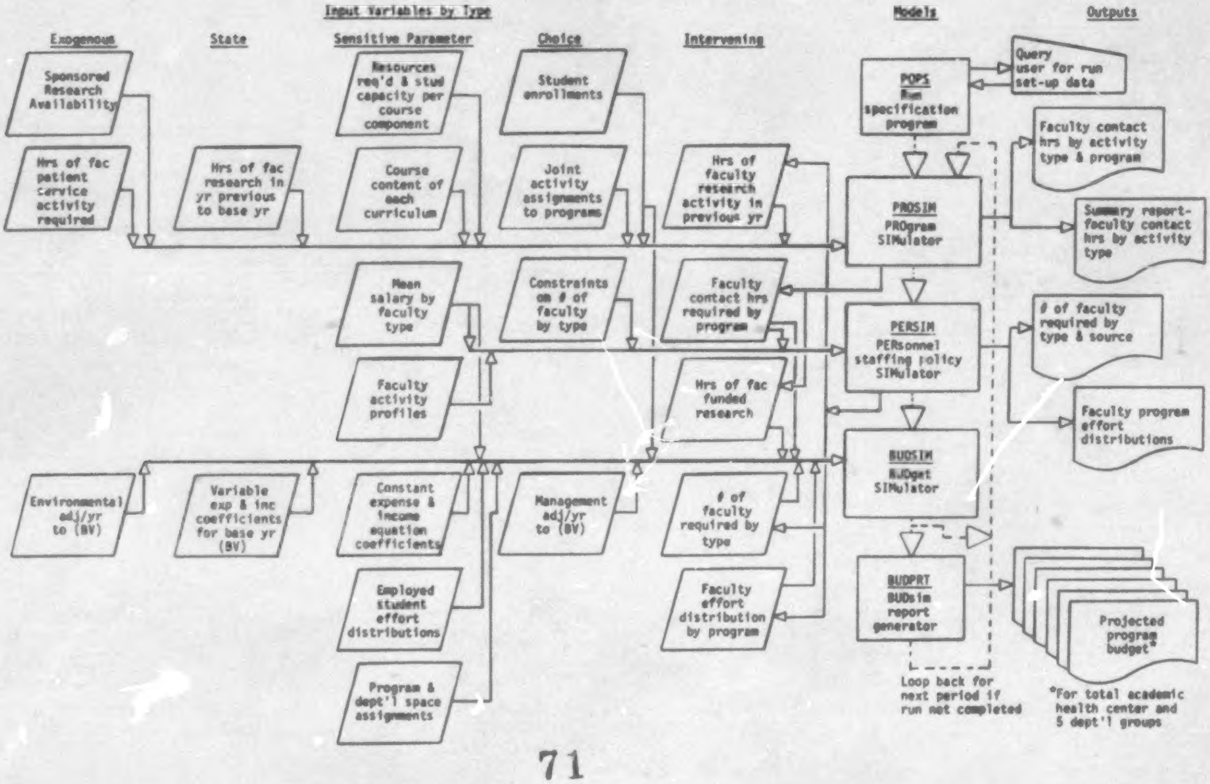
Figure 1 depicts the CWRU academic health center as it is simulated by the POPS models. Some key factors concerning this "model-eye's" view of the system are as follows:

1. Certain demand elements (graduate students, postdoctoral students, interns, and residents) in addition to requiring educational services also serve as resource inputs; that is, they provide instruction, research, and patient service effort at the operational level.
2. From the point of view of the medical school, demand for patient service is handled as a requirement for a given number of physician man-hours per year which must be supplied by faculty.
3. Within the operations of the institution certain activities are viewed as existing only to provide the appropriate institutional environment for its missions of teaching, research, and patient care (denoted by the "intra-institutional services" arrows on the left side of the operations sector in Figure 1. This is true of administration, faculty professional development, and community services. Similarly, the activity of research not only produces results in satisfaction of an independent demand (via sponsored research projects) and is thereby a legitimate program output in its own right, but also contributes to an institutional environment necessary to carry on effective programs of teaching and patient service. Thus, some of the cost of research activity (to the extent that it is not "purchased" via funded research projects) is allocable to the teaching and patient service programs. An analogous rationale applies to patient service with respect to teaching and research.
4. Certain faculty activities within the operations sector clearly produce joint products. At CWRU the most frequently occurring activities of this type are those involving instruction and research (for example, a graduate student working under a faculty member's direction on his dissertation research project) and instruction and patient service (for example, a faculty member with students accompanying him on his ward rounds). The hallmark of joint-product activities is that the effort relating to any single product produced by the joint activity is not rigorously separable. For program costing purposes, however, some arbitrary split is normally utilized.

Figure 2 is an overall schematic of the POPS model system showing the input variables by type, the simulation models and their linkages, and various available output

Figure 2

POPS-SIMULATION MODEL FLOW SCHEMATIC


Input Variables by Type
Exogenous
State
Sensitive Parameter
Choice
Intervening
Models
Outputs
Sponsored Research Availability
Hrs of fac patient service activity required
Hrs of fac research in yr previous to base yr
Resources req'd & stud capacity per course component
Course content of each curriculum
Mean salary by faculty type
Faculty activity profiles
Student enrollments
Joint activity assignments to programs
Constraints on # of faculty by type
Hrs of faculty research activity in previous yr
Faculty contact hrs required by program
Hrs of fac funded research
Environmental adj/yr to (BV)
Variable exp & inc coefficients for base yr (BV)
Constant expense & income equation coefficients
Employed student effort distributions
Program & dept'l space assignments
Management adj/yr to (BV)
# of faculty required by type
Faculty effort distribution by program
POPS Run specification program
PROSIM PROgram SIMulator
PERSIM PERsonnel staffing policy SIMulator
BUDSIM BUDget SIMulator
BUDPRT BUDsim report generator
Query user for run set-up data
Faculty contact hrs by activity type & program
Summary report-faculty contact hrs by activity type
# of faculty required by type & source
Faculty program effort distributions
Projected program budget*
Loop back for next period if run not completed
*For total academic health center and 5 dept'l groups

reports. The system consists of five linked computer programs which are programmed in the language BASIC and run on a time-shared computer. The five input variable types are defined as follows:

1. *Exogenous* variables are variables the values of which are established by factors which are outside the sphere of the simulated system.
2. *State* variables are those which establish the static *position of the system* at some point in time.
3. *Sensitive parameters* are those that *determine* the *reaction* of the system to various stimuli.
4. *Choice or control* variables are any variables that the *decision maker can control.*
5. *Intervening variables* are intermediate results calculated by one segment of the model system as an input to another segment. They are *internally generated inputs.*

In summary, the POPS models *simulate* the operations, staffing policies, and financial structure of the CWRU Academic Health Center, and do not automatically yield an overall optimum solution. Their purpose is to allow management to rapidly assess the resource implications of various alternate programmatic decisions. Effectiveness measurement of program outputs under various alternate operating conditions must be carried out by management external to the model system.

Analysis of an Enrollment Change

As a graphic example of the use of a simulation model to determine costs associated with proposed operational changes, POPS was used to examine the incremental costs of an increase from 400 to 600 medical students at CWRU. Since this analysis was run for illustrative purposes only the base data in the models is hypothetical. No enrollment changes in other student types were allowed and other "choice" variables were held fixed. At both the 400 and 600 M.D. student levels the model was run until steady state conditions were achieved. Figures 3 and 4 depict the model outputs for the 400 student case and the 600 student case respectively. It can be seen that the total operating expense increases from $27,955,000 per year to $31,003,000 per year as a result of the enrollment change.

A major difficulty encountered when an analyst attempts to interpret such costs in an academic health center arises because of the existence of faculty activities which simultaneously contribute to the production of more than one output program—the joint cost phenomenon discussed previously.

There is no non-arbitrary means of distributing joint activity costs to their associated simultaneously produced

Figure 3

POPS OUTPUT WITH 400 M.D. STUDENTS

```
           CASE WESTERN RESERVE UNIVERSITY - SCHOOL OF MEDICINE
RUN DATE MON 04/14/75
                    BUDSIM REPORT FOR FISCAL 19
                      (DOLLARS IN THOUSANDS)
MED SCH TOTAL
                  PAYMENT SOURCES                   PROGRAMS
                                         INSTRUCTION            RES-   PAT
                  UNIV  HOSP TOTAL    MD  GRAD+  HSE  OTHER EARCH  SERV
                                          P-DOC  OFF
DIRECT EXPENSE
  FACULTY         4411  5916 10327  1284   484  1813   248  3043  3456
  HSE OFFICERS     332  4604  4936   461     0  1676     0   178  2622
  STAFF           3324   421  3745   507   146   216    65  2393   419
  NON-SAL:FRINGE  1355   987  2342   276    78   456    39   691   803
    STUD SUPPORT  1304        1304   224   758    24     9   251    37
    MISC          2450        2450   222   193     0    23  2012     0
  TOTAL DIRECT   13176 11928 25104  2973  1660  4185   384  8567  7337

INDIRECT EXPENSE
  CWRU:PLANT       799         799   237   155     8    20   365    14
        ADMIN     1383        1383   295   175          39   875
      LIBRARY      190         190   107    63           1    18
  HOSP:PLANT       479         479    17    68    20     8   314    32
    TOT INDIRECT  2851        2851   656   461    28    69  1572    46

TOTAL EXPENSE    16027 11928 27955  3629  2140  4213   452 10139  7382
  % EXPENSE       57.3  42.7 100.0  13.0   7.7  15.1   1.6  36.3  26.4

INCOME
  PROGRAM RESTRICTED
    TUITION       1059        1059   938    89          33
    ENDOWMENT      234         234    53    10     0     0   148    23
    RESEARCH      7381        7381                          7381
    TRAINING      2482        2482        1659               823
    STATE SUBSDY  1630        1630  1630
    FEDERAL CAP.   430         430   430
    MISC GIFTS     376         376   110   124     0   107    21    13
    HOSPITAL           11928 11928                 0             11928
  TOTAL REST'D   13591 11928 25519  3161  1882     0   140  8372 11964
    % REST'D      53.3  46.7 100.0  12.4   7.4   0.0   0.5  32.8  46.9

PROGRAM NET      -2436     0 -2436  -468  -258 -4213  -312 -1767  4582

  UNRESTRICTED
    ENDOWMENT     1744        1744
    MISC GIFTS     691         691

TOTAL INCOME     16026 11928 27955

INCOME-EXPENSE       0     0     0

          OPERATIONAL DATA                     PROGRAM EXPENSE SUMMARY
     NO. OF FT FACULTY          497                            $      %
     NO. OF PT FACULTY           87           INSTRUCTION     10434  37.3
     NO. OF VOL FACULTY         609           RESEARCH        10139  36.3
     FTE'S OF HSE OFFICERS      504           PATIENT SERVICE  7382  26.4
     FTE'S OF POST-DOCS          63
     FTE'S OF GRAD STUD         105                TOTAL      27955 100.0
     FTE'S OF UNIV. UNDGR        20
     FTE'S OF MED STUD          400
     FTE'S OF OTHER STUD         78
     NET SQ FT UNIV          309717
     NET SQ FT HOSP          164843
```

Figure 4

POPS OUTPUT WITH 600 M.D. STUDENTS

```
           CASE WESTERN RESERVE UNIVERSITY - SCHOOL OF MEDICINE
RUN DATE MON 04/14/75
                    BUDSIM REPORT FOR FISCAL 19
                      (DOLLARS IN THOUSANDS)
MED SCH TOTAL
                  PAYMENT SOURCES                   PROGRAMS
                                         INSTRUCTION            RES-   PAT
                  UNIV  HOSP TOTAL    MD  GRAD+  HSE  OTHER EARCH  SERV
                                          P-DOC  OFF
DIRECT EXPENSE
  FACULTY         5227  6525 11752  1803   475  1953   234  3506  3761
  HSE OFFICERS     332  4604  4936   461     0  1674     0   178  2622
  STAFF           3750   443  4194   633   144   224    63  2682   448
  NON-SAL:FRINGE  1554  1041  2594   358    77   479    40   789   850
    STUD SUPPORT  1447        1447   367   758    24     9   251    37
    MISC          2797        2797   265   191     0    22  2319     0
  TOTAL DIRECT   15107 12613 27720  3887  1645  4356   368  9724  7720

INDIRECT EXPENSE
  CWRU:PLANT       914         914   337   158     7    18   385    14
        ADMIN     1586        1586   385   173          40   988
      LIBRARY      190         190   123    48           1    18
  HOSP:PLANT       593         593    30   105    24    10   386    38
    TOT INDIRECT  3283        3283   875   479    31    70  1776    58

TOTAL EXPENSE    18390 12613 31003  4761  2124  4387   457 11501  7772
  % EXPENSE       59.3  40.7 100.0  15.4   6.9  14.2   1.5  37.1  25.1

INCOME
  PROGRAM RESTRICTED
    TUITION       1529        1529  1407    89          33
    ENDOWMENT      247         247    56    11     0     0   156    24
    RESEARCH      8347        8347                          8347
    TRAINING      2482        2482        1659               823
    STATE SUBSDY  2445        2445  2445
    FEDERAL CAP.   430         430   430
    MISC GIFTS     376         376   110   124     0   107    21    13
    HOSPITAL           12613 12613                 0             12613
  TOTAL REST'D   15855 12613 28468  4447  1883     0   140  9347 12651
    % REST'D      55.7  44.3 100.0  15.6   6.6   0.0   0.5  32.8  44.4

PROGRAM NET      -2535     0 -2535  -314  -241 -4387  -318 -2153  4879

  UNRESTRICTED
    ENDOWMENT     1844        1844
    MISC GIFTS     691         691

TOTAL INCOME    18,390 12613 31003

INCOME-EXPENSE       0     0     0

          OPERATIONAL DATA                     PROGRAM EXPENSE SUMMARY
     NO. OF FT FACULTY          559                            $      %
     NO. OF PT FACULTY           87           INSTRUCTION     11730  37.8
     NO. OF VOL FACULTY         609           RESEARCH        11501  37.1
     FTE'S OF HSE OFFICERS      504           PATIENT SERVICE  7772  25.1
     FTE'S OF POST-DOCS          63
     FTE'S OF GRAD STUD         105                TOTAL      31003 100.0
     FTE'S OF UNIV. UNDGR        20
     FTE'S OF MED STUD          600
     FTE'S OF OTHER STUD         78
     NET SQ FT UNIV          354309
     NET SQ FT HOSP          191317
```

program outputs. However, in the academic health center programmatic changes made to alter the output of some particular product can automatically alter the output of other products as well because of the occurrence of joint activities. When the incremental cost of the change is determined, the analyst must decide between (a) ascribing the total incremental cost to the single program output which was originally sought, (b) splitting the incremental cost between the programs whose outputs were increased, using an arbitrary but unbiased and clearly stated set of allocation rules, or (c) assigning to the originally sought "primary" output the *total* incremental cost of the change *minus* any additional income which accrues to the institution from the additional production of the other outputs. This last approach was employed by the Institute of Medicine (1974) in their study of the costs of education in the health professions, and is referred to as a "net expenditures" model.

In the case of the increased M.D. enrollment example, the first approach assumes that the increased output of M.D.'s is the only useful and desired result, looks at only the expense side of the pro-forma budgets in Figures 3 and 4, and ascribes the total increased expense of $3,048,000 (which is $31,003,000 - $27,955,000) to the increase of 200 M.D. students. The resulting incremental cost per student is $15,240. This attack represents one extreme and ignores the fact that other useful outputs (research and patient service) are increased which are of value to society and also generate some additional income.

The second approach represents essentially the opposite extreme, views all increased program outputs as equally desired and thereby uses the allocated program expense numbers in the POPS reports to determine incremental cost of the increased M.D. enrollment. The expense allocated to M.D. instruction in the 400 student case is $3,629,000 and $4,761,000 in the 600 student case. The difference of $1,132,000, or $5,660 per student, ascribes only those costs to the increased M.D. enrollment which can be clearly allocated to that program using accepted cost accounting principles. This approach ignores the fact that the increase in M.D. student enrollment is *the* reason for the change (in this hypothetical case).

The third approach is to compromise between the previous two and seems to provide the most realism. It acknowledges the fact that the operational change is being made *only* because increased M.D. student enrollment is desired, but that because of joint activities other outputs are increased *which generate income*. The incremental cost using this approach is calculated as the change in total expense of $3,048,000 *minus* the algebraic change in income from those other programs whose outputs change. For "Research" the increased income is $975,000 ($9,347,000 - $8,372,000); and, for "Patient Service" it is $687,000 ($12,651,000 - $11,964,000). The resulting *net* incremental expense is ($3,048,000 - $975,000 - $687,000) or $1,386,000 which is $6,930 per student.

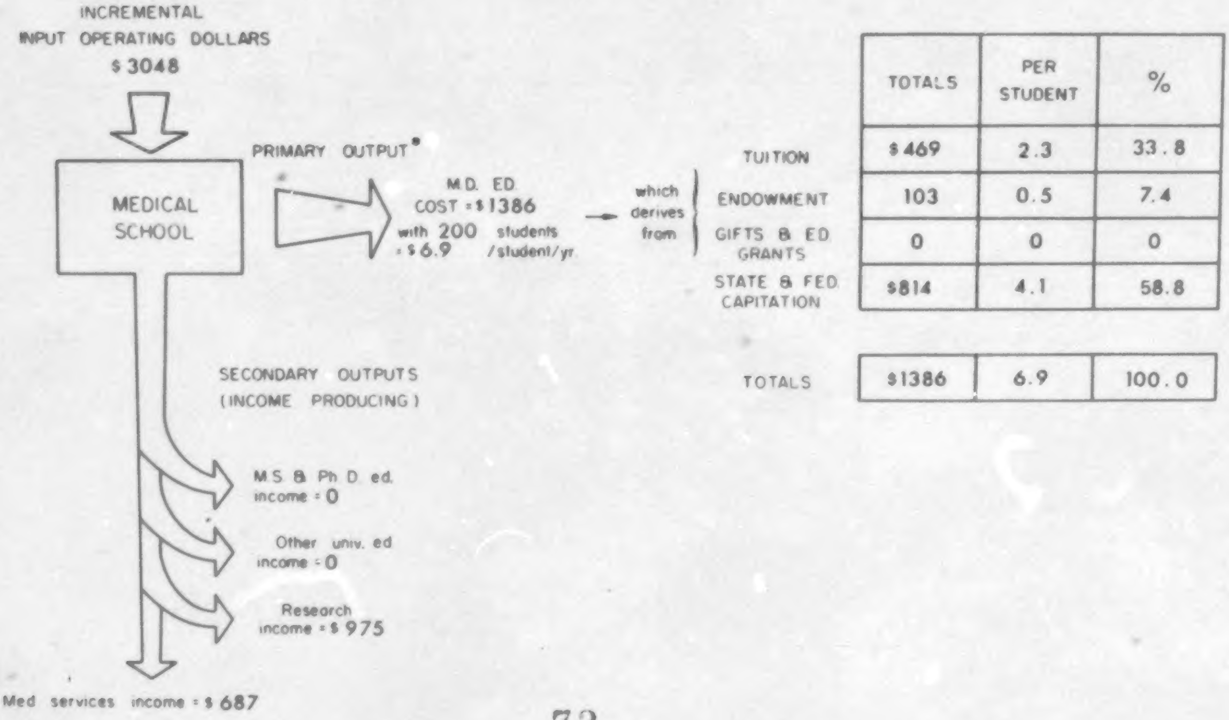
Figure 5 depicts this analysis graphically. In addition to the incremental cost analysis the diagram shows where this particular simulation derived the income to pay the additional

Figure 5

A NET EXPENDITURES APPROACH TO PROGRAM COSTING

Illustrating Incremental Cost Calculation for 200 Additional Medical Students

(Dollars in Thousands)



	TOTALS	PER STUDENT	%
TUITION	$ 469	2.3	33.8
ENDOWMENT	103	0.5	7.4
GIFTS & ED GRANTS	0	0	0
STATE & FED CAPITATION	$814	4.1	58.8
TOTALS	$1386	6.9	100.0

M.D. instructional cost. The sources shown reflect specific assumptions made in this analysis and could readily be varied depending on what constraints the analyst feels should be placed on each income source.

Conclusions

This paper has taken the position that the institutional analyst must be able to generate expected *incremental* costs associated with proposed programmatic changes in order to provide the basis for managerial decision-making. It has illustrated that simulation modeling is a tool which can provide the necessary cost and income data associated with such prospective changes in a timely fashion. Finally, it demonstrated that although simulation does not "solve" the joint cost "problem", it allows the analyst to conveniently handle joint costs aspects of an analysis depending on the assumptions made. A conclusion was reached that the "net expenditure" approach seems to be the most reasonable mode of analysis when operational changes are contemplated solely to alter the output of one particular program.

Association of American Medical Colleges. *Guidelines for academic health center cost allocation studies: Parts 1 and 2.* Washington, D. C. AAMC, 1971.

Institute of Medicine. *Costs of education in the health professions: Part III.* Washington, D. C.: National Academy of Sciences, April, 1974.

Kutina, K. L., & Lee, L. E. POPS: A program oriented planning system for academic health centers. Paper presented at the ORSA/TIMS Joint National Meeting. Boston, April 22-24, 1974.

IMPROVING FINANCIAL ANALYSIS AND DECISION-MAKING IN INSTITUTIONS OF POSTSECONDARY EDUCATION

James L. Murdock, University of Michigan-Flint, and
Dale A. Davis, Eastern Michigan University

There has developed in recent years a dilemma in the financial analysis of institutions of postsecondary education. There is general agreement that some type of financial distress or crisis exists within many individual institutions and, to varying degrees, within different institutional types. For example, the National Commission on the Financing of Postsecondary Education noted that ". . . throughout the late 1960's and early 1970's, a substantial number of reports have discussed the 'financial crisis' in the collegiate sector of postsecondary education" (National Commission, 1973, p. 185). However, this same Commission later concluded that "no generally-accepted standards or uniform criteria are available to ascertain the existence or extent of financial distress among institutions of postsecondary education" (p. 225). This recognition of a lack of criteria prompted them to recommend the development of a set of indicators that would more effectively measure the financial health or distress of an institution or group of institutions. There is general agreement that a problem exists, but less than unanimity on how it should be measured.

In August 1974 the authors were confronted with this dilemna when we performed an analysis of the financial condition of a group of private colleges and universities in a Mid-Western state. Available to us for the study were selected non-financial data (historical and projected) and the financial statements for the five-year period from 1968-69 through 1972-73. The purpose of this paper is to share with the reader the analytical approach utilized in that study. Some of the findings of the research project suggest that this analytical approach may be of use to the institutional researcher and other key administrators in financial analysis and decision-making. It is also hoped that this endeavor can contribute to the continuing search to identify those key indicators which will measure financial health or distress in institutions of postsecondary education.

Methodology

Any study of the financial condition of a particular institution or group of institutions must first determine those criteria which are going to be selected as indicators of financial health or distress. Examples are Bowen's (1968) focus on the differential growth rates of educational and general expenditures and educational and general income, Jenny and Wynn's (1970) presentation of a student aid subsidy gap, Jellema's (1973) analysis of current fund supluses and deficits, and Cheit's (1971) assessment of an institution's ability to carry out its self-determined program at a level of quality which it has set for itself. As accountants and students of higher education administration, it was surprising to note how infrequently such studies referred to data that are contained in the institution's annual financial report. Instead, the studies designed new measures, new questionnaires, or conducted extensive interviews. If the financial statement information were utilized, it was almost always the fund accounting equivalent of the profit and loss statement for the current (general) fund that was examined. The totality of the financial statements was seldom, if ever, a focal point.

This lack of consideration of the role of the financial statements is especially surprising when one considers the critical function served by the major financial statements in the profit-oriented sector of the economy. Such financial statements have served as the focal point for analysis by management, owners, potential investors, government, and other interested persons. The published balance sheet, income statement, and statement of changes in financial position have been the beginning point for an analysis of the financial activities and financial condition of the business entity. In executing the study, we focused our analysis on the information contained in the major financial statements of the colleges and universities.

This approach is also consistent with a major subdivision within the accounting process. Financial accounting has as its major objective the provision of all material and relevant financial information to persons outside the accounting entity—such as creditors, governing bodies, foundations, etc. Managerial (or cost) accounting, on the other hand, is defined as internal accounting, or accounting for the expressed benefit of management. This paper is consistent with this major subdivision of the accounting process. The initial analysis is of data presented in the institution's financial statements. Further analysis is directed toward utilization of internal data for improved management control and decision-making.

Financial Statement Analysis

A possible explanation for the failure to use college and university financial statements in analysis is the simple fact that they are difficult to understand—some might say impossible to understand. The source of much of this complexity is the utilization of the traditional fund accounting system, an accounting process for non-profit organizations that requires separation of the accounts according to the specific sources and uses of the funds involved. The result is an unrestricted current fund, a restricted current fund, an endowment fund, a plant fund, *et al.* Thus, one finds in the university financial report not three basic statements as exist in a corporate report, but two or three *for each fund.* The result is very likely substantial confusion, misunderstanding, or even distrust.

In a corporate financial statement, the reader or analyst can at least find the bottom line—net income. (Such reliance on a single figure should also be recognized as oversimplification and hazardous. Few people realize how many assumptions and estimations go into the determination of that number!) It is

Exhibit 1

BALANCE SHEET ANALYTICAL DATA

(In Thousands of Dollars)

	----1968-69----			----1972-73----			Change in	Increase	% Growth
	Total $	FTES $	% Total	Total $	FTES $	% Total	Percent	in $	1968-73
ASSETS									
Total Current	41,235	962	6.8	55,759	1,292	7.0	+0.2	14,524	35.2
Loan	17,959	413	3.0	26,924	636	3.4	+0.4	8,965	49.9
Endowment	155,506	3,742	25.8	240,230	5,914	30.0	+4.2	84,724	54.5
Annuity & Life	9,053	220	1.5	11,299	280	1.4	-0.1	2,246	24.8
Plant	378,073	8,714	62.7	464,906	10,977	58.1	-4.6	86,833	23.0
Unexpended	25,570		4.2	35,795		4.5		10,225	
Investment	352,503		58.5	429,111		53.6		76,608	
Agency	1,310	28	0.2	920	23	0.1	-0.1	(390)	(30.0)
TOTAL ASSETS	603,136	14,079	100.0	800,038	19,122	100.0		196,902	32.6
LIABILITIES									
Total Current	22,924		21.4	29,088		24.8	+3.4	6,164	26.9
Plant	80,046		74.9	84,152		71.9	-3.0	4,106	5.1
Other	3,914		3.7	3,886		3.3	-0.4	(28)	(0.7)
TOTAL LIABILITIES	106,884		100.0/ 17.7	117,126		100.0/ 14.6	-3.1	10,242	9.6
FUND BALANCES									
Total Current	18,315		3.7	26,670		3.9	+0.2	8,355	45.6
Loan	17,452		3.5	26,492		3.9	+0.4	9,040	51.8
Endowment	153,939		31.0	238,109		34.9	+3.9	84,170	54.7
Annuity & Life	8,520		1.7	10,890		1.6	-0.1	2,370	27.8
Plant	298,026		60.1	380,751		55.7	-4.4	82,725	27.8
TOTAL FUND BALANCES	494,252		100.0/ 82.3	682,912		100.0/ 85.4	+3.1	186,660	37.6

Source: Study of Independent Higher Education in Indiana: Financial Health.
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probable that the emphasis on the analysis of the unrestricted current fund revenues and expenditures has resulted from the desire to examine the statement in fund accounting which measures current operations in a manner similar to that of the corporate income statement.

However, because of the limited nature of the activities reported in the current fund revenues and expenditures statement, it is not truly analogous to the corporate income statement. That statement reports changes from all operations. To accomplish more meaningful analysis, consolidation of all fund statements must be made, an approach utilized in the study. Hans Jenny (1973) of the College of Wooster and William Wilkinson (1973) of the University of Rochester are two noted financial administrators who have also advocated another look at the financial statements and possible consolidation of that information.

Exhibit 1 indicates the information that can be generated by summarizing all of the balance sheet data for the various funds in one report—in this case the aggregate totals for all of the institutions in the study. The presentation of total dollars yields little information, but by expressing the dollars per fulltime equivalent student, a reference point against which an individual institution can measure its position is obtained. Further, by using the technique of a common size statement, whereby each asset, liability, and fund balance item is expressed as a percentage of total assets, total liabilities, or total fund balance, and by comparing these common size statements over a time period, the distribution of the respective funds within the totals can be examined. If a group of institutions is being studied, one can seek major shifts in the financial structure of the institutions. If a single institution is the focus, it is possible to identify changes in financing patterns and to measure the success or failure of the institution to generate specific fund assets.

A second use of this information is to determine how growth is being accomplished by offsetting increases in liabilities or fund balances. In the study, we computed the percentage relationship between fund balances and total assets and also determined a fund balance to liabilities ratio. This measure is analogous to the debt-equity ratio often utilized in business and is perhaps a useful indicator of an institution's financial stability, especially if viewed over the long run.

As noted previously, a commonly cited indicator of financial health or distress is the size of the current fund surplus or deficit. The consolidated information from the balance sheet presents a slightly different perspective of this measure. A comparison of the change in total real assets, total fund balances, and the reported current fund surplus/deficit for the four fiscal years for which data was available was performed. The results are presented in Exhibit 2.

Exhibit 2

CUMULATIVE CHANGES — 1968-69 — 1972-73

$ Millions	Changes in Current Fund (Accumulated Surplus/Deficit)	Changes in Total Fund Balances	Changes in Total Assets
46.2		MOR	MOR
		LOC	
25.0			LOC
24.0			CEM
		CEM	
15.0		MOT	MOT
10.0		CIT	CIT
		VAR	
		BIR SIW	SIW
7.5			VAR
			BIR LES
		SUR	SUR CED
		JIL CED	
5.0			DOK JIL MEP
		MEP LES	DOM
	JIL	DOM	KIV
		DOK	CAV
		CAV	
		KIV	
2.5			
	DOK	VIG RET	VEW RET BOM
		KAT VEW LEF	VIG KAT LEF MUR
			KAM
.5	KAM		
		BOM MEC	MEC
	BOM		
	NOL LOC DOM	KAM	VON
	CED LES MUR MOT	MUR	
0	KIV MEC VON SUR	NOL	KAW
	SIW BIR VIG CAV	KAW VON	NOL
	MEP CIT VEW KAT		
	RET KAW LEF VAR		
-.5			
	MOR		
-2.5	CEM		

The data clearly reveals the dangers inherent in using any single measure to assess financial health or distress. The clustering of institutions around ± $100,000 in current fund surpluses and deficits is indicative of effective budgetary controls, accounting manipulations, or, more likely, some of each. The authors believe the information revealed by Exhibit 2 is a strong argument for looking at the consolidated financial information in an evaluation of financial status.

The common size balance sheet, fund balance to liabilities ratio, and change in total real assets and fund balances are suggested indicators which have been derived from the financial accounting process and its current outputs. They are by no means exhaustive of the possible measures, but are hopefully indicative of a direction that future analysts should consider.

Internal Data Analysis

Beyond the financial statement data, there is available information that is seldom assembled in a usable manner. Organization and analysis of this data is another area of possible benefit to the institutional researcher and other key administrators.

Certain aspects of the role of the person in institutional research parallel the role of the cost accountant in industry and the entire concept of cost accounting. The processes of management in the industrial sector were early honed to a fine edge through the ultimate in accountability—profit. Many businesses have survived decades of poor philosophy, poor facilities, poor product, and poor public relations, but none survive extended periods of poor profits.

Higher education does not measure profit. As a service industry, it attempts to measure its outputs in terms other than profit. In fact, higher education is often compelled to find the means to exhaust particular funds to avoid losing them or having them retracted. The presence of this phenomenon makes formation of non-accountability attitudes quite easy. When increased costs and huge expenditures are defended by rhetoric rather than objective data analysis, there is little incentive for the analyst to develop sound analytical procedures.

The increasing demand for accountability, however, will not go away. Meeting these demands requires that those concerned with the problem confront it with all available means and continue to seek new approaches to meet expanding obligations.

Valuable assistance can possibly be gained from the experience of our counterparts in industry. This will require a slight adjustment in the overall approach to data collection and processing. Current attitudes reflect the philosophy of gathering data and displaying it for consumption by outsiders, *i.e.*, legislators, federal agencies, the Board of Regents, taxpayers, and tax authorities. Financial policy has too often been a reaction to the response of these outsiders. In recent years it has

Exhibit 3

TOTAL CURRENT FUND REVENUES AND EXPENDITURES, 1968-69 AND 1972-73

(In Thousands of Dollars)

	1968-69 Total	1968-69 Percent	1972-73 Total	1972-73 Percent	Change in Percent	Percentage Change Per Year	Percentage Growth 1968-73
REVENUES							
Tuition & Fees	$62,383	68.4	$80,616	70.4	+ 2.0	+ 0.4	29.2
Endowment	2,791	3.1	4,627	4.0	+ 0.9	+ 0.2	65.8
Gifts & Grants	8,864	9.7	12,029	10.5	+ 0.8	+ 0.2	35.7
Other	17,172	18.8	17,284	15.1	- 3.7	- 0.7	0.7
Total Educational & General	91,210	100.0/70.8	114,556	100.0/72.5	+ 1.7	+ 0.3	25.6
Student Aid	3,421	2.7	5,991	3.8	+ 1.1	+ 0.2	75.1
Auxiliary	34,271	26.5	37,382	23.7	- 2.8	- 0.6	9.1
Total Revenues	128,902	100.0	157,929	100.0			22.5
EXPENDITURES							
Instructional	42,857	48.7	53,026	49.8	+ 1.1	+ 0.2	23.7
Library	3,618	4.1	4,010	3.8	- 0.3	- 0.1	10.8
General & Administrative	21,035	23.9	26,570	25.0	+ 1.1	+ 0.2	26.3
Operations & Maintenance	11,004	12.5	13,752	12.9	+ 0.4	+ 0.1	25.0
Other	9,458	10.8	9,107	8.5	- 2.3	- 0.5	- 3.7
Total Education & General	87,972	100.0/69.1	106,465	100.0/67.8	- 1.3	- 0.3	21.0
Student Aid	8,906	7.0	16,106	10.2	+ 3.2	+ 0.6	80.8
Auxiliary	30,489	23.9	34,530	22.0	- 1.9	- 0.4	13.3
Total Expenditures	127,367	100.0	157,101	100.0			23.3
Transfers	994		1,004				
As % of Total Revenues	0.8%		0.6%		- 0.2	-	
SURPLUS (DEFICIT)	544		(176)				
Tuition and Fees Revenue as Percentage of Total Expenditures	49.0%		51.3%		+ 2.3	+ 0.5	

Source Study of Independent Higher Education in Indiana: Financial Health. Willaim W. Jellema, Director. Sponsored by Associated Colleges of Indiana and Independent Colleges and Universities of Indiana, Inc.

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been noted that the profit-oriented sector lacked a fully-developed social conscience. This lack of social conscience can be attributed in part to the emphasis placed on development of information for internal use by the corporate entity with an eye toward greater profits and ultimate survival. With the *Chronicle of Higher Education* recently reporting the state of Wisconsin's attempt to determine the criteria for deciding which universities should be shut and which programs eliminated, there should be no doubt that the better utilization of resources and ultimate survival concepts have reached higher education.

How, then, does private enterprise differ in its internal analyses? As previously described, the common size statement is a tool of analysis used in business. It allows direct comparisons of data that are often obscured in traditional presentation. The statements for a single accounting or fiscal period provide only static, or vertical, analysis. Depth of analysis is added by comparing the individual business with other businesses or entire industries. Static analysis gives important information about an individual entity in a group, but says little about the entity's past performance, potential, or current direction. Dynamic, or longitudinal, analysis is possible when the results of operation over a period of time are known. Comparison of an individual unit's performance over several fiscal periods gives important information about the unit's direction and potential. It allows a better judgment of the unit *vis-a-vis* other units and the entire industry.

Use of a succession of common size statements allows for yet another level of analysis beyond direction, potential, and position. The rate at which given elements of a statement being analyzed change give important clues to the internal priorities of the entity and begin to reflect the attitudes and philosophies of the decision-makers within the entity.

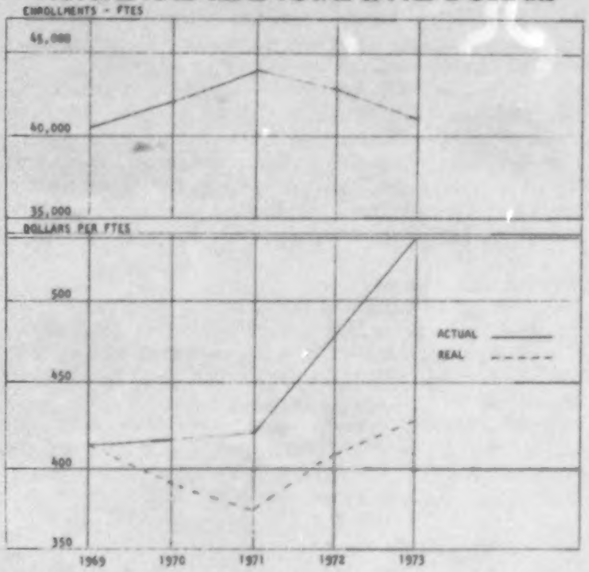
A still more refined analysis measures the speed and direction of these changes in relation to one another and allows analysis of the differential rates of change in key factors. Current fund revenue and expenditure data utilized in our study can exemplify this analytical approach and is presented in Exhibit 3. The dollar figures have been kept to a minimum to facilitate analysis. The figures for 1968-69 and 1972-73 have been restated in percentages or common size terms and all further analysis is based on these percentages.

A first level analysis reveals that tuition and fees increased more than $18.2 million and that the institutions increased their reliance on this source of funds. When a student paid tuition and fees in 1972-73, it had to cover 2.3% more of each dollar expended than it had in 1968-69. It also represented 2% more of total revenues received by the institutions (70.4%, up from 68.4%) than it had 5 years previously. That there was an actual dollar increase in revenues and expenditures is not very revealing. What does become meaningful is that there existed varying rates of change in significant areas. Tuition and fees revenues increased 29.2% in the five years, while instructional expenditures advanced only 23.7%. None of the services the student purchased increased at a rate equal to the tuition and fees increase.

Examination of the relative importance of different categories of revenue and expenditure, coupled with longitudinal growth rates, is enhanced even more when we hold the value of the dollar constant as proposed by Dr. G. Richard Wynn (1974) in his work with price deflators for higher education. Using differential rate changes and deflators to analyze a particular facet of the data would yield the following type of report which selects general and administrative expenses for analysis.

Exhibit 4

ENROLLMENTS AND GENERAL AND ADMINISTRATIVE EXPENDITURES ACTUAL AND REAL TOTAL & FTES DOLLARS



There were 26 institutions with comparable data in the study, and Exhibit 4 is prepared from that data. The actual dollar increase for the 5-year period was 31.6% compared to 6.3% in terms of real (or deflated) dollars. The expenditures per full-time equivalent student (FTES) increased from $411 in 1968-69 to $531 in 1972-73, an increase of $120 per FTES. The increase was $18 per FTES in terms of real dollars.

As the enrollment increased slightly in the first two years, it tended to generate a certain amount of efficiency in the general and administrative area. Actual dollar expenditures increased 9.7%, while expenditures per FTES on an actual dollar basis increased only 2.2%. A larger workload was being accomplished for each dollar spent. This is indicative of either a high quality of administration or a failure to react to changing conditions with the possibility that some activities previously being accomplished were now being slighted or ignored. The decline in enrollments that began in 1970-71 and continued through 1972-73 also reversed the trend in general and administrative expenditures. What may have been interpreted as higher quality administration took on the look of a seriously deteriorating situation. Those who interpreted the first two years as failing to react to changing circumstances would now take the obvious inefficiencies of the last three years as reinforcement of their charge. It is particularly important in periods of reduced productivity that items not directly related to the primary function of the institution be reduced at least in proportion to the decrease in productivity.

The concept of gauging the amount to be spent on general and administrative activities by enrollments or FTES generation or any other production measure creates some difficult problems. The concept of fixedness or variability of an expense item forces the administrator in higher education toward further analysis of internal data in the search for answers. When the analysis moves beyond the balance sheet and revenue and expenditure statements, it becomes necessary to gather internal data for analysis to be used in the management process.

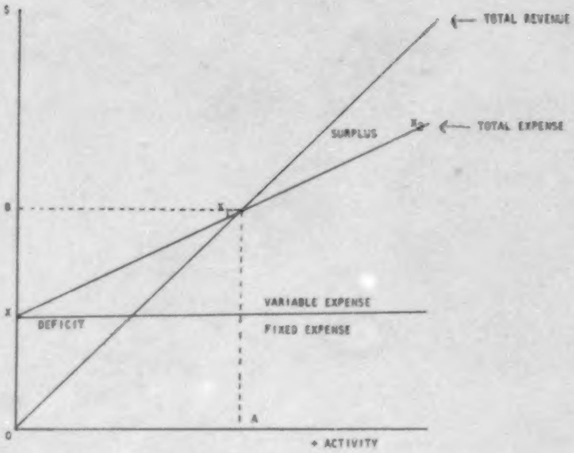
A more definitive analysis requires that all expenditures be classified as either fixed or variable. For those expenditures exhibiting characteristics of both, there are methods with varying degrees of sophistication which allow the separation of such expenditures into their fixed and variable elements. The basic reason for this division is to determine the level of fixed expense in an operation. Fixed expense is defined as the amount that will be spent for the operation without regard to the volume of activity encountered. Variable expense is that portion of the total expense which varies directly with activity, *i.e.*, the greater the activity or volume of production, the greater the expense. This is generally expressed graphically in a manner similar to Exhibit 5. As the amount of fixed expense increases as a percentage of total expenses, managerial flexibility decreases. In the example cited concerning general and administrative expense, the attitude of many academic administrators has been that this area of management had a 25 or 30-year history of understaffing, while higher education was experiencing unprecedented growth from the 1940s through the late 1960s.

To all the very logical arguments justifying the lack of flexibility in this or any other area, it can only be said that the fact that the job is difficult does not make it any less important that answers to the inflexibility be found. Recent events in industry indicate that some unexpected and somewhat dire actions become necessary. General Motors Corporation recently announced that the compensation paid to its 60 top executives was reduced by over 60% from 1974 to 1974. Fixed expense reductions are never easy. Decisions made when times are good which tend to minimize fixed expenses as a matter of policy do a great deal to add flexibility to management at all times. The lower fixed expenditure level will also allow administrators to more easily avoid deficits and more efficiently utilize resources during periods of erratic activity. Rapid adjustment to changing circumstances, one of the major problems in higher education, will become easier with this increased flexibility, but will still require quick, accurate analysis of the effect of changes.

Several cost-estimation and forecasting data processing programs in current use make good use of this concept, and it should be underscored by more detailed explanations of the concept to the user. More administrators, particularly institutional researchers, should be willing to step outside the traditional methods of analysis. Greater emphasis should be placed on managing the operation based on what is happening within the institution rather than reacting to external, and sometimes uninformed, outside agencies.

Exhibit 5

ACTIVITY—RESOURCE REQUIREMENT ANALYSIS



Activity at Level A would require dollar resources at level B.
Line X − X_2 describes total expense in dollars at any given level of activity on the horizontal axis. Point X_1 is the revenue level required to provide adequate resources for the level of activity illustrated.

Concluding Comment

This paper has presented a suggested approach to the financial analysis of institutions of higher education. The approach is based on information contained in the financial statements of the institutions or internal data that should be available in the financial records. The approach was utilized in a study of the private colleges and universities of Indiana. A copy of that report can be obtained by the reader at a cost of $3.00 from the Associated Colleges of Indiana 46204.

The authors believe the approach recommended should be understood not only by financial administrators but also by persons in institutional research and other administrative areas. Financial analysis must continue to be expanded, improved, and communicated to the public if higher education institutions are to maintain their critical function in the society.

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A COMMITTED RESOURCES APPROACH TO FACULTY STAFFING POLICIES

Stefan D. Bloomfield, Oregon State University

The arriving era of leveling student enrollments and declining financial support is forcing many universities to undertake an intensive review of their faculty staffing policies. Inevitably, such personnel studies spur renewed challenges to the concept of academic tenure and the specific administrative policies governing its conferral. Discussion of the merits of tenure is, of course, hardly a recent phenomenon, but an important shift seems to be occurring in the debate. Detractors have traditionally characterized tenure as a sinecure or a shelter for mediocrity; their arguments pictured "old dead wood" blocking the advancement of "new young blood" to the detriment of the university's instructional and research missions. The appropriate response to such charges consisted of pointing out that vitality, creativity, and noteworthy scholarship are attributes unrelated to one's age or tenure status. Furthermore, the necessity of tenure as a guarantor of academic freedom would be cited as sufficient reason for the existence of this practice.

The financial squeeze facing universities is furnishing new grounds for those who would challenge the principle of academic tenure. Persuasive arguments are now being made that the existence of tenure is threatening the very existence of the university. Indeed, the widespread critical interest currently being focused on this subject attests to the success of such a "dollars and cents" attack on tenure. The challenge has thus been thrust onto university administrators to critically examine and evaluate the precise relationship between the tenure characteristics of a university and the ability of that institution to survive—that is, its ability to carry out successfully the instructional, research, and public service missions with which it has been charged. Certainly the hazards to an institution of being "tenured-in" have been widely publicized; what remains unsettled is the point at which a university becomes tenured-in, and the specific mechanics through which a changing tenure distribution affects institutional vitality.

Tenure Quotas

An examination of any university at a given point in time will yield data on the number (or FTE) of faculty holding indefinite tenure, as well as the size of the entire faculty. The ratio of tenured faculty to all faculty is frequently cited as an indicator of institutional "health." As prestigious a group as the Commission on Academic Tenure in Higher Education (1973) has, in effect, endorsed the use of tenure quotas as an administrative tool in the formulation of faculty staffing policies. Effective management by tenure ratio, however, cannot be accomplished in the absence of a clear understanding of the mechanisms underlying changes in the ratio over time. Only recently have dynamic models been available to analytically derive and display the evolving tenure distributions resulting from specific personnel policies. The pioneering work of Oliver (1969) and LaSalle (1972) explored the long-run implications of staffing policies on tenure distributions. Although these studies yield insights into the equilibrium characteristics of tenure distributions, they offer little guidance to the administrator facing critical short-term decisions. The faculty flow model subsequently developed by Hopkins (1973) remedied this situation by emphasizing computation of short-term (five to ten years) tenure distributions resulting from various staffing policies, providing a useful tool for the formulation of operational decisions.

Flexibility Considerations

Although the means are now available to explore the relationship between faculty staffing policies and the resulting tenure characteristics of the university, the question of the suitability of tenure ratios as indicators of institutional health must still be addressed. A clue to the answer lies in the increasing usage by university administrators of the term "steady state" to describe (what they perhaps only hope will be) the future operating condition of their institution. This basic premise of steady state operation is that no new resources can be expected, and that any additional resources applied to some segment of the institution must, consequently, be taken from some other segment. The extent to which a given university is able to effect such resource shifts is a measure of the institution's flexibility—its capacity to respond to demands arising both internally and externally. Under steady state operation this flexibility determines the university's ability to accommodate new program needs resulting from shifts in student body composition or interests, from evolutionary changes in academic disciplines or newly emerging subject areas, or from new research programs reflecting changing societal needs or state-of-the art advances. The magnitude of institutional flexibility also dictates the extent to which the university can absorb decreases in financial support and yet continue to maintain programs and services at levels necessary for effective performance; such decreases have involved loss of endowment, reduction in state support, and withdrawal of gift, grant, and contract funds from traditionally supportive agencies. The flexibility at the disposal of a university emerges, therefore, as a major factor influencing the future viability of the institution.

The relationship between institutional flexibility and faculty staffing policies seems clear: the university must endeavor to maintain a faculty whose effort can be redistributed among program areas as changes in emphasis and direction occur, and which, collectively, can weather possible personnel cuts without irreparably harming vital programs. An obvious mechanism for enhancing the capacity of the university to redistribute its personnel resources is the establishment of a formal faculty development program. Such programs not only encourage faculty to make better use of the knowledge and tools they already possess, but can also "retrain" faculty members to move into academic areas needing increased staffing. However, such formal faculty development efforts require substantial commitments of institutional resources—resources which most probably cannot be spared in times of financial difficulty. Moreover, it is unclear that faculty members will choose to pursue such relearning opportunities, given the large investment they have made in their current areas of expertise.

Therefore, the need for university flexibility in staffing implies a requirement for assured faculty turnover, allowing new faculty members to be hired on a regular basis to staff the changing program needs of the institution. The faculty flow models of Oliver, LaSalle, and Hopkins recognize this important fact, and provide for analysis of rates of new appointments expected under different faculty staffing policies. The ability of these models to predict faculty turnover over moderately long planning horizons permits a university administration to more readily assess the impact that current staffing policies will have on the future flexibility of the institution.

Flexible Dollars

A shortcoming that the faculty flow models share with the less elegant tenure quota guidelines is that they are all headcount (or FTE) oriented, whereas the extent of flexibility within the university need not relate directly to the percent of faculty members holding tenure or the number of faculty members who can be newly appointed in a given year. Rather, a more accurate measure of a university's capacity to respond to change is the magnitude of the resources (and here we may read "dollars") that the institution has available for reallocation.

In his examination of steady state staffing policies, Furniss (1973) briefly mentioned the need to consider the financial consequences of a faculty staffing policy, and Freeman and Rossmeier (1973) extended this reasoning to point out the crucial role played by "flexible dollars" in a university's personnel planning activities. However, neither of these papers proposed formal mechanisms for incorporating cost factors into the formulation of faculty staffing policies. The purpose of this paper is to discuss such mechanisms, and to describe the implementation of this system at Oregon State University.

Committed Resources Index

Most tenure predicting models consider only two categories of faculty; those who have been granted tenure and those who have not. When considering the total salary costs associated with a university's faculty, however, it is convenient to identify three categories. The first consists of salary dollars that are truly flexible, such as the salaries of professors on one-year visiting appointments, or funds paid to individuals pursuing projects for which there is a definite date of termination. Salaries paid to graduate teaching and research assistants also usually fall within this category. A second category consists of salary dollars paid to tenured faculty members; these funds are completely inflexible, having been committed to the tenured staff. The third category, to be discussed in detail later, comprises the remainder of the salary dollars. These funds, in general, support faculty members considered to be on the "tenure track." In a strictly legal sense these funds should be flexible, although recent court cases raise uncertainties about the extent of an institution's commitment to its tenure track staff. The relative sizes of these three pools of salary resources create a *committed resources index*, indicating the extent to which the total faculty salary budget is immobilized by prior commitment, and the degree of flexibility remaining for distribution of those dollars.

Since faculty members who have achieved tenure also, by and large, are paid proportionately higher salaries, a committed resources index results in a more conservative assessment of university flexibility than would be indicated by a conventional tenure ratio. For example, an institution having, say, 70% of its faculty tenured may expect to find that 80% of its salary resources have been committed to those individuals. If one believes that a committed resources index presents a more realistic indication of a university's flexibility than does a tenure ratio, it would seem reasonable to borrow the technology developed for "management by tenure ratio" for use in conjunction with a committed resources index. That is, alternative faculty staffing policies could be evaluated by means of a faculty flow model which would display the implications of each personnel policy on future committed resources indices.

Unfortunately, such a procedure poses a significant technical challenge, for one must not only still predict future tenure distributions, but must also estimate the evolving distributions of salary dollars and the manner in which those dollars will be allocated among faculty members with and without tenure. Prather and Smith (1974) have pointed out the primary role played by rank as a predictor of salary; for this reason, a faculty flow model intended to estimate future values of a university's committed resources index must not only utilize variables indicating probationary periods and age groupings (as found in the tenure-predicting models), but must also incorporate considerations of rank and years in rank. Such a model is now under development at Oregon State University and will be the subject of a forthcoming paper.

Considerations of Quality

A charge commonly leveled against the managerial use of mathematical models is the failure of such analytical tools to adequately reflect qualitative aspects of the problem. Thus, in the specific case of faculty flow models it is argued that considerations of faculty quality are totally ignored, since the models seemingly define the numerical tenure ratio as the sole criterion of performance. Dill (1974) recognized this deficiency and proposed a "tenure prospect ratio" as an alternative criterion by which faculty staffing policies be evaluated. He reasoned that unless tenure track faculty members have a reasonable probability of eventually gaining tenure it will be virtually impossible to attract high calibre personnel to the institution, and equally unreasonable to expect them to participate fully and effectively in university affairs. The counterexamples offered by a few of the most prestigious universities notwithstanding, Dill's tenure prospect ratio comprises a numerical term that, at the very least, recognizes necessary conditions for maintenance of quality.

These same concerns motivate the three-tiered structure of the committed resources index. Although it is possible to aggregate all salary dollars not specifically committed to tenured faculty and to consider all resources in the resulting pool equally flexible, such a simplification would seriously misrepresent the basic realities of staffing for higher education. Specifically, even if one could be confident that salary dollars supporting tenure track personnel were legally flexible, the existence of an explicitly identified and adequately funded tenure track staff must be vigorously protected to ensure the continued quality, vitality, and institutional commitment of the university's faculty. Although there is a mathematical redundancy in what is about to be said, a "healthy" university is characterized by a committed resources index exhibiting a pool of flexible dollars sufficiently large to meet likely shifts in resource needs, a dollar allocation to tenure track appointments large enough to adequately maintain the quality of this source of new talent, and a tenured faculty resource commitment of sufficiently modest magnitude to make the two preceding conditions possible.

Implementation at Oregon State University

Oregon State University, in common with all institutions in the Oregon State System of Higher Education, has established three appointment categories for its faculty:

1. Fixed-term appointments: These appointments are made for a specified period of time. Although the appointments are renewable, the faculty members on fixed-term appointment are not on the tenure-track.

2. Annual tenure appointments: These appointments are given to faculty whom the university considers to be on the tenure-track. The appointments must be renewed each year of the probationary period, toward the end of which the faculty member is evaluated for promotion to indefinite tenure.

3. Indefinite tenure appointments: These appointments commit the university to continued employment of the faculty member. Termination is possible only for (a) cause, (b) financial exigency, or (c) program reduction or elimination.

The committed resources index consists of a three-tuple expressing the percent of total faculty salary dollars supporting faculty on indefinite tenure, annual tenure, and fixed-term appointments, respectively. For example, in the academic year 1973-74 the index for Oregon State University was 54:18:28, indicating that 54% of total salary dollars were committed to the tenured faculty (as compared to a tenure ratio of 42% for that year). Note that the specific values of the committed resources index and the tenure ratio quoted above includes all personnel on academic appointment, including graduate teaching and research assistants.

The process now being used by Oregon State University to formulate its faculty staffing plans for the coming decade involves two tasks: target values for the institution's committed resources index must be specified, and a faculty flow model which will estimate impacts of proposed staffing policies on future values of the index must be completed. Very tentative target values for the committed resources index have been proposed in the first draft of the University's Faculty Staffing Plan (1974) as follows:

> The guidelines established in this plan specify that a continuing percentage of the salary resources devoted to tenured appointments for the next 5 years will not exceed 65% with a "target" of 60% for the end of the decade as a maximum. The percentage of resources devoted to fixed-term appointments will not be less than 20%. The resources devoted to annual tenure appointments will obviously be controlled by these constraints, but will represent a continuing commitment to the inflow of highly qualified young faculty to create a stable and, hopefully, creative faculty for the decades of the '80s and '90s. It will always exceed 15% and by the end of the decade may approach 20%, depending on the hiring and tenure policies existing at that time.

The faculty flow model, which constitutes an integral part of the planning project, is still in the developmental stage. Although a variety of factors are taken into account by the model in estimating future values of the committed resources index, three variables emerge as being of primary importance. Two of these variables represent policy decisions under direct control of the university: the fraction of faculty members on appointments at annual tenure who are promoted to indefinite tenure (as a function of years of probationary service), and the percentage of new faculty appointments made to fixed-term (as opposed to annual tenure) positions. The third variable is total faculty size (and hence total faculty salary resources), a factor which is beyond control of the university, but amenable to reasonably accurate prediction.

Although the component of the committed resources ratio of greatest administrative concern is the size of the flexible resource pool, this term is computed by the model as a residual. That is, for each year being analyzed the tenure commitment is computed first; then the size of the annual tenure component is calculated (with the inclusion of an estimate of new faculty joining the tenure track). Finally, the remaining salary dollars are presumed to constitute the flexible resource pool. In effect, then, institutional policy determines the size of the indefinite and annual tenure resource requirements, while the fixed-term component is a residual determined by the externally dictated total faculty size.

Formulation of the faculty staffing plan is still under active development and review at Oregon State University. Continuing discussions indicate that the rationale behind a committed resources index is proving acceptable to both administration and faculty, and that the index can serve as a useful and persuasive tool in guiding future staffing policies.

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AN ANALYTICAL APPROACH TO THE PATHOLOGY OF ACADEMIC DEPARTMENTS

William A. Simpson, Michigan State University

It is seldom realized that most centers of higher education have been and still are managed through intuition and institutionalized customs. There is no doubt but that the average businessman would be appalled at the manner in which many key decisions are made at nearly every university. In the 1950s the comparative smallness of even the large universities enabled administrators to gain a "feel" for the problems and conditions within the departments which was conducive to intuitive decision-making. The element of smallness and uniformity was soon lost during the 1960s when most universities experienced an explosive growth both in size and complexity of organization. The situation was only saved by the fact that this growth was stimulated and accompanied by large amounts of money which relieved the need for hard decisions and masked the signs of poor management. With the recent economic downturn and the sudden loss of much financial support, it has become very apparent that past management practices are woefully inadequate. This has prompted a wave of data collecting, checking, aggregating, formating, and comparing at universities across the country. A certain amount of this avid data-gathering has been necessitated by state and legislative demands, but far more of the incentive has been due to a desire on the part of university administrators to emulate the analytical techniques which have proved so successful in the military, federal, and industrial establishments. A quick perusal of any education journal will turn up successive articles dealing with such topics as "PERT," "input-output analysis," "linear programming," "simulation models," and "PPBS"—all terms which have found their way into the educator's working vocabulary. Such an ongoing interest in data collecting and advanced management techniques would seem to indicate that an important revolution is taking place in the management of higher education, but upon closer inspection one finds that there is an incredible amount of wheel spinning. We are still trying to force educational institutions to behave like industrial enterprises in order that we may apply known techniques. But universities will never fit this convenient mold for they differ in one important way. The outputs of education cannot be well defined, quantitatively measured, and related to the inputs. Thus nearly all industrial management techniques are of no use because they essentially alter the inputs so as to maximize certain outputs. The management crisis in higher education today is not due to a lack of executive talent but rather outdated procedures and misguided attempts to copy methods which are inappropriate. Institutions of higher education must direct their efforts to the task of creating new procedures which are applicable to their unique operations. If such is the case, what does this mean to those of use in institutional research?

A New Role for Institutional Research

Many university administrators would be satisfied if institutional researchers simply continued to collect and compile data. Such managers gain a certain reassurance from being surrounded by volumes of statistics. But we must resist abetting this curious phenomena for data collection is not an end unto itself; it is simply a concise way to convey information and where there is little understandable information exchanged, it has slight value. Staff time is too costly to be expended in such a nonproductive way, no matter how psychotherapeutic it may be for some. Those in institutional research must exercise their initiative to define an expanded role which includes broader responsibilities. We must begin to feel that our responsibilities include the interpretation of our data and the development of techniques and procedures by which data may be applied to the solution of administrative problems. Some will say, "How can I possibly analyze all this confusing data?" They might well consider the value of their services if all they do is pass incomprehensible data onto busy managers to whom it is even less intelligible. Others will claim that an office of institutional research is mandated to provide data not advice. They might also ask themselves if they are charged with providing precisely "data" or is the intent that they furnish "information"—there is a difference.

To be sure, this enlarged role of interpreting data and suggesting new procedures will not always find immediate favor with administrators. We need only look at the early history of operations research to realize that a good measure of salesmanship must accompany every proposed technique. We cannot castigate administrators too much for their cautiousness, for they are charged with maintaining the existence of their complex establishments, some of which are on very unstable footing. They are not about to abandon methods which worked in the past for new procedures unless the arguments are compelling.

The remainder of this paper is given over to a specific example of the type of analysis which institutional researchers are urged to pursue.

Introduction to the Problem

From a philosophical point of view, the academic departments are the university. Since faculty salaries are 85% of a university's operating budget, the departments are also the primary component from the fiscal standpoint. Thus administrators should focus their attention on the problem of understanding the manner in which their departments are functioning and any analytical tool which aids the understanding deserves serious consideration. Anyone proposing to collect and analyze data reflecting on academic departments should be aware that this is, at first, a very delicate situation. In most universities the department can still claim a large measure of independence. Departments, nearly universally, regard data concerning their instructional operations as their personal property and its collection by administrators is viewed as being presumptive; however, as long as it is simply compiled and filed, this act is looked upon as merely another amusing activity carried out by administrators. But, if there is the slightest intimation that the collected figures will be used to evaluate the departments or allocate funds, then faculty concern mounts exponentially. However, once it is explained that data will not be used in such nonproductive pastimes as ranking departments and that no simplistic allocation "formula" is to be applied, the faculty will be cooperative. It is clear to most people that the current tight budgets require that for every department given an increase in funds, there are other departments which must suffer a decrease. Most would prefer that decisions of gain or loss be arrived at on the basis of criteria applied uniformly to hard data rather than evolving from a round of highly subjective discussions and the interplay of personalities. During this phase of educating the departments, an administrator must be ready to explain how the data will be used. It is wise to resist the temptation to avoid friction by playing down the role which the data will assume in the decision process, for then the faculty will immediately object to wasting their time supplying data which has no real use.

Developing the Fundamental Equation

Assuming that this problem of winning faculty support can be surmounted, let us now consider the analysis itself. What we seek is a small set of data elements and a unifying relationship which provide insight into the instructional operations of a department. Many would prefer a costing approach, but if one first solves the problem of how to increase the efficiency of each department, then the problem of minimizing cost will have taken care of itself.

Considering the man measurable parameters of a department such as contact hours, section size, credits, enrollments, student credit hours, which are the most critical? The key requirement is that the primary measure of a department's efficiency must be beyond departmental control. Thus, we reject many of the commonly used measures in favor of the student credit hour load per full-time faculty equivalent (SCH/FTE).

The total SCHs produced by the department represent its total instructional output. We may also look at this SCH total as representing the flow of students through the department's courses and, thus, indicating the input or *demand* for the department's services. As long as a department enrolls every student who wishes to take a course, then the SCH figure can represent demand as well as output. This is not always clear, as evidenced by the fact that sometimes a department which has a particularly low SCH output is told by the dean to improve it. If the demand does not exist, nothing can be done, unless the department is expected to conduct a sales campaign.

We now demonstrate how to gain an excellent picture of the department by looking at three pieces of data: SCH/FTE faculty, contact hours/FTE faculty, and weighted average class size. It would be difficult to defend the value of any of these data elements if considered individually, but when unifed by a single relationship they are very enlightening. In any model, the value of the whole far exceeds that of the sum of its parts.

Before we state the fundamental relationship, the data elements should be well defined:

$$\text{SCH} = \sum_{\text{all sections}} (\text{section enrollment}) \times (\text{course credit})$$

Weighted average class size =

$$\frac{\displaystyle\sum_{\text{all sections}} (\text{section enrollment}) \times (\text{course credit})}{\displaystyle\sum_{\text{all sections}} \text{course credit}}$$

We define FTEF as the number of full-time faculty equivalents. Every institution has its own definition of who is considered faculty and how to allocate instructional time. Nothing is lost by keeping the definition general. For convenience we shall let

$$K = \frac{\displaystyle\sum_{\text{all sections}} \text{course credit}}{\displaystyle\sum_{\text{all sections}} \text{contact hours}}$$

The unifying equation is:

$$\text{SCH/FTEF} = K \times (\text{wt. avg. section size}) \times (\text{contact hours/FTEF}) \qquad (1)$$

From the above relationship we can readily discern a fact of which every department chairman is intuitively aware. By scheduling enough small sections and independent studies a department can establish a crushing teaching load or, in the case of an overstaffed department, create enough work for everyone. Thus, it is clear that a department can create any workload image and back it up with selected data. The use of the preceding equation allows an administrator to see what is really happening within a department as opposed to what appears to be happening.

An administrator who is faced with the problem of allocating resources is nearly always seeking the answer to one or both of the following questions:

1. Which departments are inappropriately staffed?
2. Which departments are using an inappropriate instructional model?

Equation (1) will not absolutely answer either question; its primary purpose is to narrow the field of feasible answers; the final decision will still be a matter of calling for judgment.

Figure 1 concisely illustrates all the possible relative magnitudes of the variables in the fundamental equation. The exact significance of this figure will become clear after we have considered a few of the cases in detail.

Analysis of Cases

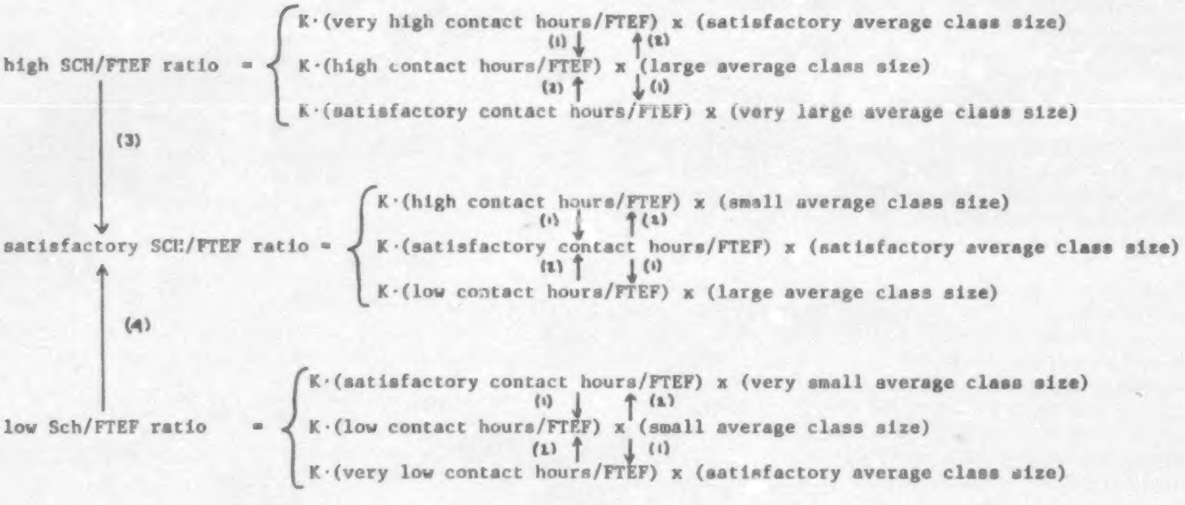
Inappropriate Staffing. To discern the extreme cases of under- and overstaffing only the key element SCH/FTE will be used, for, as was pointed out, the average section size and contact hours/FTEF ratio can be adjusted up or down, but the SCH/FTEF value is beyond departmental control, being a function of demand. The first step consists of finding those departments with an extreme SCH/FTEF value. This is not as straightforward a problem as it appears. Within any university it is possible to find two departments, one having four times as large an SCH/FTEF value as the other. For example, a clinical medical department may have 100 SCH/FTEF per semester versus over 400 for the mathematics department, and yet both departments may be operating very efficiently. The reason for this is that different disciplines may require different teaching models. It is clear that the judgment as to what value is high or low cannot be based upon an absolute scale but must also take into consideration the discipline. The easiest way to handle this is to partition the departments up into sets which should use roughly the same instructional model. Care must be taken not to confuse similar disciplines with similar models, e.g., a department of art history using the lecture-recitation model should not be in the same set as the studio art department. Thus the natural inclination to group departments by college must be resisted, for otherwise many mismatches will result. After the partitioning has taken place, the average SCH/FTEF can be calculated for each set of departments. Departments with an SCH ratio differing a significant amount from the mean of its partition set can then be selected for further study.

Such an internal comparison of department outputs is in general a workable procedure. However, there is always the chance that a set of overstaffed departments will be compared with each other and judged to be properly staffed. This type of problem can be overcome if data for comparison is obtained from comparable universities. Such an exchange would not be too difficult as only three data elements for each department are needed and these data elements would generally be available. It is possible that the SCH/FTEF ratio for the History Department at University A may differ from the ratio for the History Department at University B, but it is very unlikely that University A's History SCH ratio will differ much from the average ratio of ten history departments of peer institutions—at least not for any valid reason. An administrator working with peer institutional data stands on much firmer ground.

After the comparisons have been carried out and a set of departments which have extreme SCH/FTEF ratios has been obtained, we are ready to make staffing decisions.

Figure 1

DEPARTMENTAL VARIABLES—THEIR MAGNITUDE AND THE METHODS BY WHICH TO CHANGE THEM


high SCH/FTEF ratio =
K·(very high contact hours/FTEF) x (satisfactory average class size)
(1)
(2)
K·(high contact hours/FTEF) x (large average class size)
(2)
(1)
K·(satisfactory contact hours/FTEF) x (very large average class size)
(3)
satisfactory SCH/FTEF ratio =
K·(high contact hours/FTEF) x (small average class size)
(1)
(2)
K·(satisfactory contact hours/FTEF) x (satisfactory average class size)
(2)
(1)
K·(low contact hours/FTEF) x (large average class size)
(4)
low Sch/FTEF ratio =
K·(satisfactory contact hours/FTEF) x (very small average class size)
(1)
(2)
K·(low contact hours/FTEF) x (small average class size)
(2)
(1)
K·(very low contact hours/FTEF) x (satisfactory average class size)

Value Scale

very high (very large)
high (large)
satisfactory
low (small)
very low (very small)

} all relative to average values used for comparison

Methods to Change Variables

(1) combine sections, decrease independent study, and offer courses with low demand less often

(2) divide large classes into smaller sections

(3) add more faculty

(4) either decrease staff or, if the demand exists, enroll more students by using larger classes or creating more sections

PATHOLOGY OF ACADEMIC DEPARTMENTS

Case 1. Departments with a very low SCH/FTEF ratio.

We must be careful when using the output SCH/FTEF to gauge the input or demand. If all students interested in a department's courses were enrolled, then the demand was fully met and yet did not provide a high enough output per faculty member. This indicates an overstaffed department. Whether to decrease the staff or not is a matter of specifics. If the department is large, perhaps having just been built up in the last decade to meet a surge of interest which has recently declined, then trimming the staff back is probably the answer. However, if the department is already small, then a further cut migh reduce it below what could be considered the "critical mass" necessary for the interchange of ideas and research. In this case, some thought must be given to the basic philosophy of the university. Many feel that universities are the preservers of knowledge charged with maintaining a nucleus of scholars in every major area of learning irregardless of the ebb and flow of public interest. Under such a philosophy some departments, which have little current demand, must be carried along as overhead.

It is possible that a department will have a low SCH/FTEF ratio and yet many students will be unable to enroll in some selected courses due to overcrowding. This indicates that the demand is not being met even though the staff is large enough to handle more students. The problem here is that too many small sections are being used or the faculty are carrying too light an instructional load; a look at the average class size and the contact hour/FTEF ratio will reveal which it is. A protesting department chairman should be required to present very specific reasons why his department should be permitted to operate so far off the norm for similar departments at peer institutions. Figure 1 shows that the low SCH/FTEF ratio can be forced back to a satisfactory level by the measures discussed above. Note that the figure does not contain the subjective issues.

Case 2. Departments with very high SCH/FTEF ratio.

Contrary to popular opinion, a high SCH/FTEF ratio does not necessarily indicate an extremely effective department. Such a ratio means that the faculty are teaching large sections or taking up a heavy instructional load. The former could be a disservice to the students and the latter to the faculty; student comments and the faculty research record would disclose if such were the case. The addition of new faculty members would correct either problem.

The foregoing cases involved staffing problems which were analyzed by using primarily the SCH/FTEF ratio. Now we consider the cases where the SCH/FTEF ratio is satisfactory but the department is plagued by other problems, just as serious as under- or overstaffing, but harder to detect.

Inappropriate Instructional Model.

Case 1. Department has average SCH/FTEF ratio, high contact hour/FTEF ratio, and small average section size.

This is a situation which commonly occurs when the faculty indulge themselves by teaching courses in their particular specialty to small groups of interested students. Once this pattern is created, it appears to the faculty that they are being overworked and that the obvious solution is to add more faculty. An administrator who is unaware of the relationship of the different variables and who is provided only with the high contact hour/FTEF figures will easily be convinced that an increase in staff is called for. By this decision, inefficiency is rewarded and it will not be long before many similar situations will develop within other departments. The correct move is to insist that small sections of a given course be combined and that courses with very small enrollments be offered at less frequent intervals. If independent study arrangements are common, then some cutback in this area must be made.

Case 2. Department has an average SCH/FTEF ratio but a large average class size and low contact hour ratio.

This is another common configuration. The appropriate solution here, however, is more a matter of judgment and local conditions. Studies have shown that there is no measurable output which supports the claim that small lectures are more conducive to learning than large lectures. If this is axiomatically accepted then, as often suggested, any lecture with enrollment between 30 and 200 must be considered inefficient, and we would be inclined to encourage large classes. But, if there is strong student feeling about the department's large classes and depersonalized instruction, then the proper decision may be to create more sections with smaller enrollments and increase the faculty contact hour load.

Increasing the Complexity of the Model

If the data collection system is adaptable enough to provide a rather wide disaggregation of department data, the three-variable fundamental equation (1) can be expanded into a more complex equation which gives a better basis for decision.

We now want to express a department's SCH/FTE output as a function of:

(1) the ratio $K = \frac{\Sigma \text{ credits}}{\Sigma \text{ contact}}$ hrs. for undergraduate and graduate study
(2) proportion of graduate study
(3) proportion of undergraduate study
(4) proportion of independent study
(5) undergraduate and graduate weighted average section size
(6) contact hours/FTE

The appropriate equation is:

$$\begin{aligned} SCH/FTE = (\text{contact hr/FTE}) \Bigg[& K_{UG} \cdot (\text{UG wt. avg. section size}) \cdot \left(\frac{\text{UG contact hrs.}}{\text{total contact hrs.}}\right) + \\ & K_{GRAD} \cdot (\text{GRAD wt. avg. section size}) \cdot \left(\frac{\text{GRAD contact hrs.}}{\text{total contact hrs.}}\right) + \\ & K_{\text{IND. STUDY}} \cdot \left(\frac{\text{IND. STUDY contact hrs.}}{\text{total contact hrs.}}\right) \Bigg] \qquad (2) \end{aligned}$$

In using this model for internal comparisons of departments, we first group like departments into discipline categories. The fact that there is a wide variance in the value which some of these variables take on—even within the same discipline category—is to be taken into account using this new model. It is felt that a department's values for variables (1) and (2) are intrinsic to that department, whereas the other three controllable variables should be close to the averages established for the department's discipline category.

Using a department's value for parameters (1) and (2) and its discipline category's average value for (3), (4), and (5), the expected SCH/FTE faculty output can be calculated for a department. This is calculated by using the discipline category average data for the variables marked with an asterisk. If the actual output fails to reach this mark, a reduction in staff may be the indicated action. A look at the parameters should reveal how a staff reduction could be accommodated (e.g., increase section size, reduce the amout of independent study, etc.). Conversely, if the actual output exceeds the calculated value, this would indicate a department which should possibly have an increase in staff. The analysis using equation (2) follows the same pattern as the analysis using equation (1). The more complex equation allows us to make allowances for certain differences between departments.

Conclusion

The preceding examples demonstrate the blending of numerical and subjective evidence needed to arrive at a reasonable decision. The analytical techniques are very simple, requiring only a minimum of data and an understanding of the equations. Once all the departments have been analyzed a few times using the simple equation (1), other refinements will have suggested themselves and the level of sophistication can gradually be raised in the manner suggested by the more complex equation (2).

As a start, the method is workable and heeds the motto, "Better to be roughly right than precisely wrong."

OPTIMIZING FACULTY STAFFING DECISIONS IN CHANGING AND CONFLICTING CONDITIONS

Charles H. Belanger, University of Montreal
F. Craig Johnson, Florida State University

Within the past several years, some postsecondary institutions, particularly small and private colleges, have been forced to terminate both tenured and non-tenured faculty members. Declining enrollments and increasing per-student cost have forced these institutions to dismiss tenured faculty members for economic reasons (financial exigency) rather than for traditional reasons (insubordination, incompetency, and moral turpitude). Meanwhile at other institutions, primarily large and public universities, non-tenured faculty members have been hired to develop new areas (nuclear medicine) and revive old ones (power plant engineering) so that these institutions can remain vital and can meet the changing needs of society.

Criteria for recruiting and dismissing faculty members must take into account both the financial resources available to each institution and the special need society has for educational services. Administrators and faculty members who must satisfy these changing and often conflicting conditions need to establish a dynamic priority system if postsecondary education is to continue to meet society's needs.

The purpose of this paper is to provide an operational definition of "financial exigency" as it relates to faculty expansion, reduction, or reallocation among academic disciplines.

Changing and Conflicting Conditions

The existing faculty staffing models built during the 1960s reflect the conditions of those years. That decade was marked by an unprecedented growth not only in higher education but in most spheres of the nation's economy. As a result, individuals as well as social organizations were geared to make short- and long-term plans based on the expectancy of continuous growth. The stable conditions of the 1970s require a reassessment of existing managerial tools which were developed for more affluent times.

Rapid postsecondary education enrollment growth, prevalent in the 1960s, has virtually disappeared. Instead, most colleges and universities are now struggling to adjust to a period of low, stable, enrollment growth. While both enrollment and income were growing rapidly, incremental funds could be distributed with relative ease to departments and schools that exhibited the most growth. Academic units were able to hire new faculty in areas where strength, support, or expansion was desirable and needed. These conditions favored administrative flexibility. Stationary and even declining enrollments have reduced this flexibility to such an extent that "across-the-board" cuts have signaled a crisis of survival. Since the flow of money has become leaner, dollars have to be taken away from areas with non-existent or declining growth to maintain growing areas. As a consequence the hiring of new faculty has been curtailed in spite of changing program needs and institution vitality. The integrity of the institution has been threatened because faculty salary budgets have been insufficient to maintain basic manpower in areas of inquiry within disciplines.

Conceptual Framework

The significance of this paper had its roots in the belief that if faculty staffing decisions were made to satisfy institutional personnel management objectives without considering the integrity of a discipline, the internal structure of the discipline would be endangered. An illustration of this condition is found in the following brief hypothetical situation which uses a typical chemistry department. Chemistry is a discipline in which basic elements can be identified. These elements are analytical chemistry, biological chemistry, inorganic chemistry, organic chemistry, and physical chemistry. Each faculty member within a typical chemistry department is identified with one of these five elements. Furthermore, each element is essential in order to have a department of chemistry externally recognized. Consequently, this department of chemistry must make absolutely sure that each of these five critical elements is adequately staffed. If staffing is reduced below a certain level the college no longer has a recognized chemistry department and the integrity of the college and ultimately of the institution is called to question. To expand this premise, the structural approach can be paralleled with that of a chess game in which pieces of three different values are found. The descending order of these pieces based upon utility as a function of freedom of movement are as follows: queen (key specialist), rook (specialist), and pawn (graduate assistant). Faculty members can be assigned a value to the discipline using a similar ranking system:

1. At least one key specialist is required for each element of a discipline in order to maintain identity of the discipline element.
2. A key specialist must be retained to give identity to the element regardless of his teaching assignment.
3. The student course load capacity of a key specialist is established in quantified terms.
4. Student enrollment, which is in excess of a key specialist's student course load capacity, generates a demand for additional specialists.
5. Secure positions must be filled by and maintained for key specialists.
6. A specialist, whose position is secured by enrollment, is secure to the extent that enrollment justifies his position.

Procedure

The test to be performed in this study was to find out how much effect a budget reduction would have on key specialists if staffing decisions were made solely upon the basis of institutional personnel management criteria. In order to assess this test, two sets of criteria had to be developed. The first series of criteria was exclusively related to institutional personnel management policy dealing with selected faculty attributes and productivity activities. The second series consisted of disciplinary criteria, that is, a special set of requirements or particularities of a discipline that were established in order to preserve the integrity of a discipline.

Data were collected from six selected disciplines at Florida State University: Chemistry, English, History, Mathematics, Philosophy, and Psychology. Those specific disciplines were chosen for two reasons: (a) they represented three main branches of study, namely, the Humanities (English, Philosophy), the Pure Sciences (Chemistry, Mathematics), and the Social Sciences (History, Psychology); and (b) as long-established disciplines, their discipline elements were expected to be more evident.

The collected data were categorized in three broad areas: (a) personal information on each faculty member's attributes (salary, race, sex, tenure and rank status); (b) FTE/SCH productivity of each faculty member (instruction, research, public service, advisement, and administration); and (c) data conducive to the development of disciplinary constraints (division of each discipline into its discipline elements, identification of each regular faculty member with one discipline element, and classification of each regular faculty member as a key specialist or a specialist).

Data related to faculty attributes were obtained either from the Office of Institutional Planning and Budgeting at Florida State University or from other semi-public documents[1] which were published by the Florida State University or the State University System of Florida, but had a rather limited circulation.

The productivity area data were also obtained from various sources. The Registrar's Office provided the data pertaining to the course number(s) taught by each faculty member, and the number of credits attached to each course along with the number of students enrolled in them during the Fall Quarter 1973. This information was sufficient to compute the number of SCH's produced by each faculty member and department. In order to transform those SCH's into productivity coefficients, the productivity factors[2] used by the Florida Board of Regents were applied to each of the selected disciplines for the five productivity activities being recognized by the budgeting formula.

The third phase of the actual data collection consisted of gathering information leading to the establishment of disciplinary constraints. The first step consisted of dividing each discipline into its discipline elements. Based on the program offerings exposed by each department in the *Florida State University Bulletin* on the departmental reports produced in 1972 for the Florida State University self-study (1972), a provisional division was attempted. In the second step each regular faculty member was identified with one discipline element within a specific discipline. A tentative classification was made by surveying for the last two years the course(s) was taught by each regular faculty member as listed in the *Schedule of Classes* published every quarter at the Florida State University, and by examining the publication record[3] of each regular faculty member, when applicable. Finally, in the third step, each regular faculty member was assigned a rank within the discipline element with which he was associated. To begin with, this rank was based on each regular faculty member's publication record. The original purpose of this ranking represented a search to differentiate key specialists from specialists. For each of the three steps described above, there was a discussion with each department chairmen in which he was asked to verify the initial differentiations. In some cases, department chairmen were contacted more than once to make sure that no misunderstandings had occurred.

Once the collection of actual data was completed, the data elements were incorporated into an integer linear programming model. The criteria described briefly in the procedure section then became the constraints built into the model. For each constraint, the left-hand-side of the equation represented the actual data collected on each faculty member or, differently stated, the contribution of each faculty member to a departmental standard figure set on the right-hand-side of the equation. The standards were established either from Florida State University policies (salary, tenure, rank), discipline particularities (race, sex, key specialists), or Board of Regents formulas (productivity factors).

Finally, to simulate a severe financial situation in each of the selected departments, a search was made for a uniform budget reduction that would affect at least one key specialist in each discipline. This reduction was to take place in such a way that the maximum number of faculty members would be retained within certain established managerial and disciplinary constraints considered simultaneously.

Faculty Characteristic

The faculty attributes and average FTE productivity were compiled for each of the three faculty groups exhibited in Table 1 which uses the chemistry faculty as a prototype.[4] It can be readily observed that the typical key specialist was a white male holding tenure and a high professorial rank. His salary fell well above the departmental and university average faculty compensation.[5] His average FTE productivity was generally close to the 1.0 position, which was the expected standard.

Table 1

CHARACTERISTICS OF KEY SPECIALISTS, SPECIALISTS, AND GRADUATE ASSISTANTS IN THE CHEMISTRY DEPARTMENT

	Key Specialists N= 10		Specialists N= 26		Graduate Assistants N= 10	
Characteristic	No.	%	No.	%	No.	%
Tenure Status						
Tenured	10	100%	16	61%	0	0%
Nontenured	0	0%	10	38%	10	100%
Rank						
Professor (P)	10	100%	19	73%	0	0%
Associate P	NA	NA	NA	NA	NA	NA
Assistant P	0	0%	7	27%	10	100%
Instructor	NA	NA	NA	NA	NA	NA
Race						
White	10	100%	26	100%	8	80%
Black	0	0%	0	0%	2	20%
Sex						
Male	10	100%	25	96%	9%	90%
Female	0	0%	1	4%	1	10%
Average Salary	$27,550		$17,125		$6,000	
Average FTE Productivity	1.00FTE		.79FTE		1.60FTE	

The specialist's characteristics were slightly different from those of the key specialists in several respects. Even though the specialist group was composed of more blacks and females, the ratio was still very low. Overall, 40 to 45% of the specialists were tenured whereas approximately 50% of them had their status of full-rank professors or associate professors. The average salary of the specialist was about equal to the average salary across the six disciplines or to the average faculty salary of the respective department. His average FTE productivity resembled that of his key specialist colleague.

Finally, the graduate assistant group differed totally from either of the two previous groups. All were non-tenured and had the instructor rank. In most instances, the ratios on race and sex were much higher. Their average salary was at the very bottom of the scale, but their productivity rose well above the expected standard.

Faculty Composition

The number of key specialists fluctuated widely from one discipline element to another, depending upon the internal structure and the need for depth in a particular discipline element. Generally speaking, the department chairmen who identified sub-discipline elements selected one key specialist to cover each sub-discipline element. Across disciplines, the number of key specialists accounted for approximately 25% of the entire faculty of each department. The second group of faculty members was referred to as specialists. This group constituted the largest portion of the faculty in each department, that is, from 60 to 65%. As previously defined, the number of specialists was expected to be directly dependent upon the student enrollment exceeding the key specialists' student course load capacity. Most specialists were closely identified with one discipline element, but some of them were overlapping two or more discipline elements. Finally, the graduate assistants represented the last group of faculty members. For practical purposes, graduate assistants were assigned temporary faculty appointments. The primary nature of their assignment consisted of teaching students enrolled in lower-level courses. In all departments they represented the smallest of the three faculty composition groups.

Budget Cut Simulation

The lowest uniform budget reduction that affected at least one key specialist in each of the disciplines surveyed was found to be 20%. As the disciplinary constraints consisted of key specialists to be protected, a first computer run was simulated without making the disciplinary constraints effective.

By looking at Table 2, the magnitude of the damage done to the discipline and its discipline elements can be readily assessed. In the example of the chemistry department, affected faculty members were all key specialists. Biological chemistry and physical chemistry were left totally deprived of the key specialists considered as essential to protect and give leadership to these elements.

When disciplinary constraints were added to the institutional personnel management constraints, specialists became the ones whose positions had to be terminated (Table 3). Those specialists were affected for much the same reason as the key specialists: their salaries were out of proportion with their productivity as measured by the budgeting formula (Table 4). The difference between these situations lay in the fact that key specialists were brought in to play a role of identity and leadership within a particular discipline element, whereas specialists' positions were generated by student enrollment. Consequently, in a situation where a department had to optimize its scarce resources within managerial and disciplinary constraints, those faculty members who contributed the least to the optimality objectives were the most severely affected.

Table 2

DISTRIBUTION OF THE CHEMISTRY FACULTY AND IDENTIFICATION OF FACULTY MEMBERS AFFECTED BY A 20% BUDGET CUT, WITHOUT DISCIPLINARY CONSTRAINTS

Discipline Elements / Faculty Composition	Analytical Chemistry	Biological Chemistry	Inorganic Chemistry	Organic Chemistry	Physical Chemistry	Faculty Affected by 20% Budget Cut
Key Specialists N= 10	K_1	K^*_2	K^*_3 K_4 K_5	K^*_6 K_7 K_8	K^*_9 K^*_{10}	5
Specialists N= 26	S_{11} S_{12} S_{13}	S_{14} S_{17} S_{15} S_{18} S_{16}	S_{19} S_{22} S_{20} S_{23} S_{21}	S_{24} S_{27} S_{25} S_{28} S_{26} S_{29}	S_{30} S_{33} S_{36} S_{31} S_{34} S_{32} S_{35}	0
Graduate Assistants N= 10	G_{37} G_{38}	G_{39} G_{40}	G_{41} G_{42}	G_{43} G_{44}	G_{45} G_{46}	0

* Affected faculty member.

Table 3

DISTRIBUTION OF THE CHEMISTRY FACULTY AND IDENTIFICATION OF FACULTY MEMBERS AFFECTED BY A 20% BUDGET CUT, WITH DISCIPLINARY CONSTRAINTS

Discipline Elements / Faculty Composition	Analytical Chemistry	Biological Chemistry	Inorganic Chemistry	Organic Chemistry	Physical Chemistry	Faculty Affected by 20% Budget Cut
Key Specialists N= 10	K_1	K_2	K_3 K_4 K_5	K_6 K_7 K_8	K_9 K_{10}	0
Specialists N = 26	S^*_{11} S_{12} S_{13}	S^*_{14} S_{17} S_{15} S_{18} S_{16}	S_{19} S_{22} S_{20} S_{23} S_{21}	S_{24} S_{27} S^*_{25} S_{28} S_{26} S_{29}	S^*_{30} S^*_{33} S_{36} S^*_{31} S_{34} S^*_{32} S_{35}	7
Graduate Assistants N= 10	G_{37} G_{38}	G_{39} G_{40}	G_{41} G_{42}	G_{43} G_{44}	G_{45} G_{46}	0

*Affected faculty member.

Summary and Conclusion

This study was an attempt to test a concept based upon the belief that faculty staffing decisions made solely upon institutional personnel management criteria would endanger the vitality of the discipline.

After solving an integer linear programming problem, the findings of this study suggested that disciplinary criteria be considered along with managerial criteria when faculty staffing changes have to be made because of financial exigency. In addition to maintaining a balance on a number of very important managerial criteria, it was obvious that the department chairman needed to analyze carefully the discipline elements to be covered and determine the number of key specialists needed in order to avoid being lock-stepped in his decisions. Failure to recognize this variable could lead either to irreparable damage to the discipline or to management by crisis.

Implications

The first implication would be a plea for the addition of disciplinary constraints in existing formula-driven models and futuristic optimization models. This study arrived at the conclusion that disciplines could be structured in recognized discipline elements with key specialists required to preserve and give leadership to these elements.

A second implication makes clear that tenured faculty members are not immune from dismissals in times of financial exigency. Those faculty members who are not essential to preserve the structural integrity of an academic discipline and whose salaries jeopardize the financial stability of a department and its academic programs are potential victims of financial exigency.

The third implication suggested by the findings of this study is that the seniority system cannot be applied to dismiss faculty members if the discipline is to remain vital. This implication is in contradiction with the usual scheme argued by collective bargaining units.

The fourth implication recognizes the fact that a department can have only a limited number of faculty members whose positions are not dependent upon student enrollment. Those positions are usually filled by faculty members whose credentials demand higher salaries. Therefore, departments should make appropriate provisions to satisfy these requirements when they arise.

The final implication suggests that contractual agreements between faculty members and institutions specify whether or not a faculty member is hired as a key specialist or as a specialist. Both parties would know to what extent tenure and continuing employment are expected.

Table 4

SELECTED CHARACTERISTICS OF CHEMISTRY FACULTY MEMBERS AFFECTED BY THE 20% BUDGET CUT

Characteristic*	Without Disciplinary Constraints	With Disciplinary Constraints
Classification	Key Specialists (N=5)	Specialists (N=7)
Average Salary	$30,970	$23,000
Average FTE Productivity	.21FTE	.43FTE

* Tenure status, rank, sex, and race were left out of the table because, under both conditions, the affected faculty members were all tenured professors or associate professors, males, and whites.

[1] For examples of these documents see Office of Institutional Planning and Budgeting (1973) and *The 1973-74 Operating Budget* (1973).

[2] The productivity factors specific to each discipline can be obtained from the authors or the Florida Board of Regents.

[3] Publications are listed in Graduate Research Office of the Florida State University (1971, 1974).

[4] Findings obtained from the five other departments are available from the authors.

[5] The average faculty compensation across the six departments was $15,250, whereas the departmental average for the chemistry department was $16,973.

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STUDENT RATINGS—AN INFORMATION SOURCE FOR DECISION-MAKING

Doris Burton, Indiana University

In a time when higher education institutions face steady or declining enrollments and faculty size, must be accountable to the public, and must comply with equal opportunity and affirmative action regulations, evaluation of faculty teaching performance becomes increasingly important. Indeed, a 1971 court decision, *Griggs v. Duke Power Company* (401 U.S. 424), held that the employer must show that any requirement for employment and promotion must have a demonstrated relationship to the employment. By implication such a decision would require that colleges demonstrate that they use meaningful, concrete, nondiscriminatory (with respect to sex or race) procedures or instruments to evaluate teaching performance.

One of the major problems faced when one attempts to measure teaching performance is the lack of any general agreement on specific traits or behavior patterns which a teacher must have in order to be effective. This is not difficult to understand when one considers that teaching occurs in an environment where the type of instruction, personal characteristics of the instructor, personal characteristics of the students, subject matter, and size of class all interact.

Institutions of higher education have been concerned with measuring effective teaching and have used student ratings of traits or behaviors presumed to be important in effective teaching as one means of such evaluation since the 1920s. Thousands of articles have been devoted to student ratings, yet during this time period little attention has been devoted to determining whether such ratings meet any criteria which would make them valuable in the decision-making process for retention, promotion or tenure, or whether such ratings meet any of the implications posed by affirmative action and equal opportunity regulations. Additionally, if student ratings are collected and made available to faculty members or administrators, the chances are great that such ratings will be used in evaluating teaching.

The present study examines the use of student ratings in administrative decision-making by testing whether such ratings meet the following criteria.

1. The rating form should have a set of interrelated items which presumably measure teaching performance and which remain stable over time. This is a test for the reliability of the instrument and the stability of students' perceptions of important aspects of teaching skill. This is important because administrative decisions are based on performance over time.

2. Ratings given by students must distinguish between instructors. Ideally, such ratings should distinguish between each instructor, but realistically they must at least distinguish between those who are outstanding and those who are poor. This is important at Indiana University because faculty members must be judged outstanding in one area—teaching, research, or service—and adequate in the other two areas. If teaching is used as the criterion for promotion, the faculty member must be judged outstanding.

3. Ratings given to an instructor by students in the same class should be reasonably consistent, i.e., the students within a given class should perceive the behavior of an instructor in a reasonably consistent manner. This is a measure of the reliability of the judges.

4. Extraneous variables over which the instructor has little control should not bias the ratings the instructor receives. Such variables include the size and level of the class, and such student characteristics as the reason the student enrolled, grade point average, expected grade, major, and class standing. Additionally the grading practices of the instructor should not bias the ratings the instructor receives.

To determine whether ratings in the Department of Political Science at Indiana University, Bloomington campus, met these criteria, 10,145 ratings obtained in 207 classes at the 100, 200, and 300 level taught by 61 instructors during the period from the fall semester of 1970-71 through the fall semester of 1973-1974 were analyzed. Classes at the 400 level were eliminated since these courses are all seminars rather than lecture-discussion type classes.

Factor Stability Over Time

Fifteen items from the instrument were used for a principal components factor analysis with orthogonal rotation to determine whether there was a set of interrelated items which indicated important aspects of skill as perceived by students. The results of this analysis revealed four factors in six semesters and three factors in one semester. The first factor was named *skill* and reflected the instructor's attitude toward the subject, the instructor's ability to explain, his speaking ability, whether students wished to take another course from the instructor, and the overall rating of the instructor. Additionally in four semesters this factor also contained the items rating the organization of the course and the organization of the daily course work. A second factor was named *rapport* and contained items concerning the instructor's attitude toward students, his tolerance of disgareement, and the opportunity for questions and answers. The third factor was named *structure* and in four semesters contained items relating to the organization of the course as well as items relating to helpfulness of examinations with respect to furthering understanding of the subject. The fourth factor was unnamed but was somewhat related to the course structure as well.

The factor structure was tested for similarity over time, using Kaiser's method (Veldman, 1967, pp. 236-241), and all factors were found to be very similar across the set of seven semesters. The only exception to this was that the relationship of the skill factor for the first six semesters to the skill factor for the seventh semester was much weaker. During the seventh semester the items dealing with organization were a far more important aspect of skill than was true in earlier semesters. Data from spring semester 1973-74 was subsequently analyzed in the same manner and indicated a strong similarity to the first six semesters.

The factors found on the instrument used by the Political Science Department were very similar to those reported for other instruments evaluating teaching. Analyzing the *Purdue Rating Scale for Instructors*, Creager (1950) reported two factors, rapport and professional impression. Bendig (1954) found two factors, instructor competence and instructor empathy, in his analysis of the Purdue instrument. Coffman (1954) analyzed the Oklahoma Agricultural and Mechanical University scale and found four factors: empathy, organization, "normal" individual as opposed to "absent minded professor," and verbal fluency. Isaacson, McKeachie, Milholland, *et al.* (1964) found 6 factors in a 46-item form: skill, overload, structure, feedback, group interaction, and student-teacher rapport. Isaacson's was the only one which compared factor stability across semesters, students, and instructors.

The importance of factor stability across semesters, students, and instructors is that students' perceptions of important dimensions of teaching performance remain stable over a four-year time period. For decision-making using student ratings, this stability is significant because it means that the ratings are comparable from year to year.

One item which most administrators and faculty members feel is an important aspect of teaching skill, the ability to motivate students, was not perceived by students to be an important aspect of teaching skill. This result may have occurred because the item asked whether students were stimulated to do work beyond that required by the course which is not a characteristic exhibited by very many students. If the question asked whether the lectures or class materials and presentations were stimulating and challenging, the motivation aspect might have been reflected as a measure of skill.

Internal Consistency of the Instrument

The instrument was also tested for reliability by means of correlating responses to odd-numbered questions to responses for even-numbered questions using the ten items which were shown to be important by means of the factor students' and instructors' analysis. These correlations were corrected by the Spearman Brown formula to give the reliability coefficients which ranged from .86 to .90 over the 7 semesters. These coefficients compare very favorably to the .88 coefficient reported by Lovell and Haner (1955) and the .93 coefficient reported by Spencer and Aleomoni (1970).

From this analysis one can conclude that the instrument is a reliable one and that the students' perceptions of dimensions of teaching effectiveness remain stable over time. Thus, the ratings obtained by the students meet the first criterion proposed.

Discrimination between Instructors

The instrument was further analyzed to determine whether each item discriminated between those instructors receiving ratings in the top and bottom quarter of ratings for each semester. This analysis indicated that all but two items, the coverage of an appropriate amount of material and the relationship of lecture and instructional materials to examinations, did discriminate between ratings in the top and bottom quartiles.

In order to be useful for decision-making ratings must distinguish between instructors. To determine whether the ratings met this criterion, a standardized scale score was computed using the seven items which loaded highly on the skill factor. The intraclass correlation coefficient, R, a measure of the homogeneity of ratings within classes in relation to the homogeneity of all ratings was computed for each semester. While R was statistically significant for all 7 semesters, the range of R was .17 to .32 which meant that scores could be assigned to a specific class with only a 17% to 32% chance of a correct assignment. Thus, the ratings did not distinguish between each class.

A second analysis was performed, based on the assumption that those obtaining scores in the top quarter could be classified as outstanding and those in the bottom quarter as unsatisfactory, with the remainder of the ratings being considered satisfactory. Those receiving ratings in the top quarter comprised one group and those receiving ratings in the bottom quarter comprised the second group. In this analysis the R was much higher in 6 of the 7 semesters, ranging from .43 to .58, indicating that there is a sharper distinction made between these 2 groups than among each and every class. Thus, the student ratings would appear to be useful in distinguishing in a broad sense between those instructors who are outstanding and those instructors whose performance is poor.

Classroom Consistency

The third criterion proposed that student ratings within a given class should be fairly consistent in their ratings of the instructor. While the intraclass correlation coefficient has already given an indication that ratings within a class were homogeneous, another analysis was performed. Each class was randomly divided in half and the mean score on the ten items on the three factors was computed for each half of the class and then these mean ratings were correlated. In only 20 classes were the correlations not significant at the .05 level. In these classes there were less than 20 students providing ratings. There were, however, 33 classes with less than 20 raters which did have high correlations. The chances, though, are greater that ratings obtained from 20 or more raters will be more consistent (reliable) than ratings obtained from less than 20 students.

Influence of Extraneous Variables on Ratings

The fourth criterion proposed for the use of student ratings is that such ratings be fair and unbiased by student characteristics, environmental characteristics, or grading characteristics of the instructor. Costin, Greenough and Menges (1971) reviewed much of the research in this area, the results of which are very mixed. Many of the reservations expressed by faculty members regarding the use of student ratings for decision-making relate to the issue of large classes, 100 level introductory classes, the student's expected grade, and the grades the instructor gave to the class. Each of these variables was examined individually by means of a one-way analysis of variance, and then all the variables were examined together by means of a two-stage multiple regression analysis.

Class size. To examine the impact of size, classes were split into 5 size categories using intervals of 50. When size was examined, it was found that large classes per se did not lead to detrimental ratings since in 3 semesters the best group means were in classes enrolling 101-150 and over 200 students received the best group mean.

Using the multiple regression analysis, the major finding was that class size generally resulted in a negative regression coefficient (indicating that class size was inversely related to the instructor's rating) regardless of whether the class size was small (0-50 students) or large (over 100), both of which resulted in 4 negative coefficients. On the other hand, only 4 significant positive coefficients were found—once for classes enrolling 51-100 students, twice for classes enrolling 101-150, and once for classes enrolling 151-200. One must conclude that class size has some impact on ratings, but the results indicate no clear relationship between class size and instructor rating.

Class level. The classes were also examined on the basis of the level of the class and, while the 300 level classes received the best group mean in three semesters, classes at the 100 and 200 level each received the best group mean in two semesters. While there may be a slight advantage to teaching at the 300 level, there is apparently no great disadvantage to teaching at the 100 level. If a department has a policy whereby all instructors teach at all levels over the course of several years, there would probably be little bias in the ratings as a result of the level of the class.

With respect to class level, 100 level classes resulted in no significant coefficients and 200 level classes had 1 positive and 1 negative regression coefficient. The interaction between level and size presented very mixed results with no clear pattern of relationships between class size and class level. Size variables appear to be more important than level variables and, when size variables are significant, they are likely to affect ratings adversely whether the classes are small or large. In any event, size, level, or the interaction between them, accounts for a very small amount of variance and thus does not appear to bias the ratings seriously.

The student characteristics examined were the reason the student enrolled in the class, the student's attitude toward the class, grade point average, grade being earned in the class, class standing, and major.

Reason enrolled. Students who wanted to take the course from the instructor always gave the instructor a better rating, but the proportion of students in this group is small, ranging from 1.5% to 4.6% of all students. On the other hand, students who enrolled because they needed credits or the course was the only one open at registration consistently rated instructors lower. Again, the percentage of students in these 2 categories is small, ranging from 6.0-9.7. Since there is always more than one course open at registration and since students may usually take any number of courses to obtain needed credits, these reasons may reflect the fact that the course selected is at a time which fits into the student's schedule, or it meets some type of requirement. A significant number of students indicate that the reason they are taking the course is because it is a requirement, and this results in lower ratings. However, since the Department has no requirements at the 100, 200, or 300 level, presumably students were meeting some type of college or distributional requirement.

Attitude. There is a direct linear relationship between the student's attitude toward the subject matter of the course and the instructor's rating. Enthusiastic students rate instructors highest and students who are not interested rate instructors lowest.

Class standing. In four of seven semesters class standing had no impact on ratings. In those semesters where ratings were affected, graduate students always rated instructors higher than undergraduates. There was no clear trend on the part of undergraduates. Graduate students also comprise a small percentage of students enrolled in undergraduate level courses, ranging from 1.32% to 4.51%; however, they are concentrated in 300 level classes.

Grade point average. In only one semester was there a difference in ratings on the basis of the student's grade point average. In this instance students with a 3.5-4.0 grade point average rated instructors significantly higher than students with a 2.5-2.99 grade point average. Grade point average clearly is not important.

Grade being earned in the course. In six semesters there was no difference in ratings as a result of the grade the student was currently earning in the course. In one semester students expecting a D gave instructors lower ratings. Again, it appears that the grade being earned does not affect the ratings appreciably.

Major. In three semesters the student's major had no impact on the instructor's rating. In three semesters political science majors gave instructors higher ratings, and in one semester education majors gave instructors the highest ratings. There is some evidence then that political science majors have a tendency to give instructors a higher rating.

Using multiple regression analysis for the student characteristics revealed that the reason the student enrolled was important only in the spring of 1971, accounting for 1.74% of the variance. Student's class standing was important in both semesters of 1971-72 accounting for 1.10 and 3.15% of the variance respectively. The student's grade point average was significant in the fall of 1971 accounting for 1.6% of the variance. Grade currently being earned was significant in three semesters, but accounted for only 0.95, 0.37 and 0.62% of the variance.

The student characteristic of overwhelming significance is the student's attitude toward the subject matter of the course accounting for 6.29% to 13.18% of the variance. The total amount of variance accounted for by all the student characteristics over 7 semesters ranged from 8.3% to 15.08%. It is easy to see that student attitude is the one characteristic which has a significant impact on the ratings. However, one can argue that this is not a characteristic which should be considered as beyond the control of the instructor; and, thus, this should not be considered as a biasing student characteristic.

The two-stage multiple regression was done because there is an interaction between the student characteristics and the class size and level variables. There are more freshmen in 100 level courses, more graduate students and political science majors in 300 level courses, and grade point averages rise as class standing rises. For this analysis the student characteristics were entered first, and thus the same characteristics remain important, but the impact of class size and level is lessened by entering these variables second. For instance, there were 26 cases where size and level variables were important when these were the only variables being considered. When student characteristics are also considered, 18 size and level variables remain statistically significant, but only 5 of these 18 account for 3% or more of the variance in the instructor ratings. The size and level variables show a random pattern with no one size or level or interaction of size and level being consistently important. The total amount of variance accounted for by all the class size and level variables and the student characteristics ranges from 16.19% to 26.9%.

The Impact of class grade on the ratings. To examine the impact of the grades the instructor gave on the ratings, the mean class grade was computed for each class. Then the ratings from classes receiving grades in the top 25% of grades and those for the bottom 25% of the grades were compared. In four semesters there were no differences in the average ratings students gave to instructors in these two groups. In another two semesters instructors giving lower grades received higher ratings and in only one semester did instructors giving higher grades receive higher ratings. Thus the grading leniency of the instructor appears to have little impact on the ratings.

From the analyses of the student characteristics and the class size and level characteristics, it is clear that the only variable which has a great impact on the rating the instructor receives is that of the student's attitude toward the subject matter. This is certainly not a characteristic over which the instructor has no control, and therefore one can conclude that the student ratings obtained in the Political Science Department are free from consistent bias. Occasionally there are instances where a given variable has some impact, but the impact of any single variable is very little.

One concludes that the student ratings in this study do provide a valuable source of information to be used in decision-making. The ratings meet the proposed criteria with varying amounts of success. However, such ratings gathered on a consistent basis over an extended time period do provide a means for reliably determining how effective students perceive a given instructor to be. This is not to argue that student ratings should be the only measure of teaching effectiveness, but they certainly can be part of the information considered in making decisions on retention, promotion, and tenure.

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TENURE AND PROMOTION: A COMPARATIVE SIMULATION

John Goveia, Willamette University

The impetus for this study can best be explained by the following statement:

> The Commission recommends that each institution develop policies relating to the proportion of tenured and non-tenured faculty that will be compatible with the composition of its present staff, its resources and projected enrollment, and its future objectives. In the Commission's nearly unanimous judgment, it will probably be dangerous for most institutions if tenured faculty constitute more than one half to two thirds of the total full-time faculty during the decade ahead. The institution's policy in this matter, which should be flexible enough to allow for necessary variation among subordinate units, should be used as a guide in recruitment, reappointment, and the award of tenure. (Commission on Academic Tenure in Higher Education, 1973, pp. 50-51).

Tenure has become a controversial issue at many colleges and universities. Many have modified present tenure systems; others have abolished tenure completely. (See *The Chronicle*, July 2, 1973). However, since tenure systems of one kind or another are in existence at most colleges and will, apparently, continue to exist despite the current debate, it is of interest to investigate the long range consequences of various policies for the granting of tenure and promotion. A principal concern of many administrators is that continuation of their present policy may result in a faculty which is almost all tenured and which contains a large percentage of senior persons. They object to this because it would severely limit the addition of new, younger, more innovative, "up-to-date" faculty.

The results of a simulation of various promotion and tenure policies at the undergraduate college at Willamette University (approximately 1200 students and 85 full-time faculty) are reported in this paper. The output of the model is a profile of the full-time faculty in terms of tenure, rank, age, sex, and percentage with the doctorate. The main findings of this study show that in order to maintain a faculty that is less than two-thirds tenured, a 50% tenure policy must be implemented. Moreover, one must remain at the rank of instructor, assistant, and associate on the average of five, eight, and nine years respectively.

Approach and Data

The input to the simulation model is a data deck containing each faculty member by department, seniority, rank, age, tenure, degree, and sex. The policy variables that may be changed in the model are:

Tenure Policy
1) number of years in system before eligible for tenure
2) percentage of those eligible to receive tenure

Promotion Policy
1) number of years seniority before eligible for assistant, associate, or full professor
2) other requirements for promotion such as doctorate

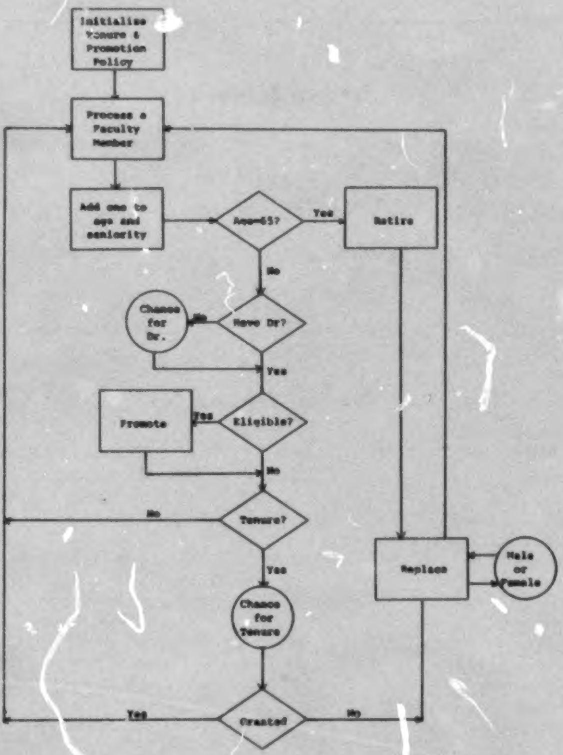
The basic model can best be depicted in a flowchart on the following page.

Assumptions

The model makes certain assumptions about the faculty body. These assumptions do not vary from simulation to simulation. The assumptions may be changed in future runs, but it was felt that the following are fairly realistic although simplified at times.

The model assumes:
1) Faculty size is stable.
2) A faculty member must have a certain number of years of experience to be promoted.
3) The rank of full professor may not be obtained without the doctorate or equivalent.

Figure I



TENURE AND PROMOTION

4) A fixed percentage of faculty receive tenure.
5) Retired and dimissed members are replaced by 50% female members.
6) The model is recursive in form. State two cannot be generated until state one is computed.

Salaries

Part of the output generated by the model is a simulation of salaries. The median salary by rank was used in order to determine total wages. Another figure computed was total average compensation (includes fringe benefits). A 5% per year salary increment was granted to all faculty. By inspecting this portion of the output one may determine the dollar impact various decisions have on the university budget.

The model assumes that when one is promoted one receives the average compensation of that rank. This may have the effect of overstating the total compensation. However, employing this technique has the advantage of maintaining consistency and making the models comparable on a dollar basis.

Table 1

Percent Tenured

Tenure Policy	1973	1976	1980	1983	Replacement Policy
90%	51.7	70.5	87.0	82.3	Assistant Age 30
80%	51.7	65.8	84.7	81.1	Dr.
70%	51.7	61.1	77.6	78.8	**Promotion Policy**
60%	51.7	62.3	75.2	72.9	Inst. 5 years Asst. 7 years
50%	51.7	60.0	72.9	69.4	Assoc. 8 years

Percent Tenured

Tenure Policy	1973	1976	1980	1983	Replacement Policy
90%	51.7	71.7	90.5	84.7	Instructor Age 28
80%	51.7	67.0	87.0	82.3	Non-Dr.
70%	51.7	69.4	81.1	77.6	**Promotion Policy**
60%	51.7	63.5	81.1	78.8	Inst. 5 years Asst. 8 years
50%	51.7	60.0	67.0	65.8	Assoc. 9 years

Percent Tenured

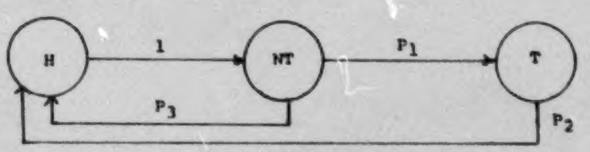
Tenure Policy	1973	1976	1980	1983	Replacement Policy
90%	51.7	69.4	89.4	85.5	Assistant Age 30
80%	51.7	68.2	87.0	83.5	Dr.
70%	51.7	67.0	82.3	80.0	**Promotion Policy**
60%	51.7	61.1	74.1	75.2	Inst. 5 years Asst. 8 years
50%	51.7	62.3	70.5	65.8	Assoc. 9 years

Outcome

Table 1 summarizes the outcome of three simulations run over a period of ten years. It shows the implications of various tenure policies. Table 2 shows what impact tenure has on committed dollars.

A Simple Markov Chain.[1] In this model there are three states. H is the hiring pool, NT is the non-tenured faculty, and T is the tenured faculty.

Figure 2



The diagram shows arrows only for those probabilities which will be chosen non-zero in the discussion which follows. Note P_1 denotes the probability of becoming tenured, P_2 denotes the probability of returning to the hiring pool (resigning or dying), and P_3 denotes the probability of not becoming tenured.

Table 2

A Hypothetical Example of Positions Versus Dollars*

	N	Tenured Faculty	Percent of Total Faculty with Tenure
Professors	25	25	25
Assoc. Profs.	25	22	22
Ass't. Profs.	25	8	8
Instructors	25	0	0
	100	55	55

FTE Dollars

	N	Tenured Faculty	Percent of Total Faculty with Tenure
Professors	$ 550,000	$ 550,000	33.33
Assoc. Profs.	450,000	396,000	24.00
Ass't Profs.	375,000	120,000	7.27
Instructors	275,000	-	-
	$1,650,000	$1,066,000	64.60

Although 55% of the faculty are tenured, 64.6% of the dollars are committed.

*Thanks to Dr. Thomas M. Freeman, Associate Director of Institutional Research, Michigan State University.

[1] Thanks to R.S. Hall, Chairman Mathematics Department, Wilamette University.

Expressed in matrix form the above model corresponds to

$$\begin{array}{c} \\ H \\ NT \\ T \end{array} \begin{array}{c} \begin{array}{ccc} H & NT & T \end{array} \\ \begin{bmatrix} O & 1 & O \\ P_3 & 1\text{-}P_1\text{-}P_3 & P_1 \\ P_2 & O & 1\text{-}P_2 \end{bmatrix} \end{array}$$

The equilibrium vector for this model is (Kemeny & Snell, 1960):

$$\alpha = \frac{1}{P_1 + P_2 + (P_1 + P_3)P_2} [(P_1 + P_3)P_2, P_2, P_1]$$

This corresponds to

$$\text{T:}\quad \text{Fraction of Faculty Tenured} = \frac{P_1}{P_1 + P_2}$$

$$\text{NT:}\quad \text{Fraction of Faculty Not Tenured} = \frac{P_2}{P_1 + P_2}$$

$$\text{H:}\quad \text{Hiring as a Fraction of Faculty} = \frac{(P_1 + P_3)P_2}{P_1 + P_2}$$

If we assume that the unit of time is the probationary period for tenure, we can assume that $P = 1-P_1$. We can then assign values to P_2 (the probability of tenured faculty turning over) and investigate the affects of changes in P_1 (the probability of attaining tenure) upon the value of α (the equilibrium state of the model).

If we imagine that the unit of time is 7 years and that the total faculty lifetime is 35 years, then the value of $P_2 = 1/3$ seems reasonable. We can now choose values of P_1 and compute values of T and NT.

P_1	T	NT
.3	.47	.53
.4	.55	.45
.5	.60	.40
.6	.64	.36
.7	.68	.32
.8	.70	.30
.9	.73	.27
1.0	.75	.25

Note the values of the 50% tenure policy and the 100% policy, this may come as a surprise to some administrators.

If P_2 is chosen equal to 4/15 with the thought that the unit of time is 6 years in the probationary period and the total length of time in the system is 36 years, the following can be expected.

P_1	T	NT
.3	.53	.47
.4	.60	.40
.5	.65	.35
.6	.69	.31
.7	.72	.28
.8	.75	.25
.9	.77	.23
1.0	.79	.21

Notice the implicit assumption that non-tenured faculty is absolutely loyal and immortal, not overly presumptuous in today's job market.

Readers are encouraged to use the findings developed in this paper on their own campus.

Summary

The Monte Carlo method was applied to the actual data of a small liberal arts university. The Markov Chain model arrived at its results independent of size of stage of development of the faculty. Both methods arrived at remarkably similar results. If one is going to pursue traditional promotion and tenure policy and keep faculty size fixed, it is imperative that a 50% tenure policy be implemented if one is to remain under the 2/3 tenure mark. However, if one does not object to surpassing the 3/4 mark in the long run a 100% tenure policy would achieve the 3/4 goal.

Commission on Academic Tenure. *Faculty Tenure.* San Francisco: Jossey-Bass, 1973, pp. 50-51.
Kemeny, & Snell, J. L., *Finite Markov Chains.* New York, Van Nostrand, 1960, Chapter 4.

FACULTY DEVELOPMENT: AN INSTITUTIONAL PARADOX

Burnedetta Kincy-Bates,
Institute for Services to Education

Quality education is the key concept in higher education today. How to maintain and improve quality education under changing conditions and new stresses is a major issue confronting colleges and universities. Colleges and universities must see that their programs and faculties keep pace with the rapidly growing stream of knowledge. Wise decisions must be made about goals and their accomplishments. To make wise decisions, faculty as well as administrators should keep abreast of current trends and ideas. To be of the greatest service in improving higher education, planning must be considered. To plan well requires a comprehensive overview of the confronting issues.

A crucial issue confronting developing institutions has been the relative narrowness of their course offerings and an upgrading of their administrative and teaching staff. McGrath (1965) pointed out the need for predominantly black college faculty members to keep their teaching in touch with new knowledge being produced in their disciplines. A serious weakness of these colleges was an inability to reward their faculty members with leave of absence to further their studies through degree-granting programs. The financing of such a program would place an inordinate burden on the colleges; hence faculty members of predominantly black colleges had 30% of their faculty with the Ph.D. degree compared to 50% in the nation as a whole.

The enactment of Title III Higher Education Act of 1965 was a direct response to the issue of faculty development. The act provided for National Teaching Fellows and Professors Emeriti to go into developing institutions and release the permanent staff for advanced graduate study. Hodgkinson (1974) indicated that the National Teaching Fellows' Program was rated as one of the most successful programs by the developing institutions. Further, more faculty members at developing institutions now have obtained their doctorate degree, particularly at black institutions, than ever before. Other social and legal pressures for compliance to the Civil Rights Act of 1964 have caused a number of predominantly white institutions to recruit black graduate students for their faculties. Other black graduate students have been attached to private industry, while others return to their sending institutions.

Purpose

The purpose of this study is to ascertain a reason why faculty members of developing institutions returned or did not return to their sending institutions after receiving a faculty development grant. Developing institutions are those which are struggling for survival and are isolated from the main currents of academic life. Faculty Development Grants were given to the institutional participants for one year and renewable at the end of the year until completion of the terminal degree. Grants were given in the amount from one-fourth salary to total salary. Faculty Development programs existed at 34 predominantly black institutions. These institutions work in cooperative arrangements through the institutional research program.

Statement of the Problem

Faculty development may be assessed by several criteria, one of which is the completion of a degree program; another is return to the sending institution. Of primary concern to developing institutions are reasons why some faculty members return or do not return to their jobs and what things tend to facilitate the return. The problem for this study is to identify factors regarding returning and not returning to one's previous employment after receiving a faculty development grant.

Limitations of the Study

The study is limited to public and private, two-year and four-year colleges who have received Faculty Development Grants under Title III for the purpose of upgrading education credentials of permanent staff. It is recognized that those nonreturning faculty members who took positions in private industry or predominantly white colleges may be more difficult to obtain responses from, hence bias the sample. However, a high percentage of the faculty members receiving Faculty Development Grants do return to their sending institutions. Therefore, these results may be restricted to similar programs at other developing institutions.

Review of Literature

A real need exists today for a thorough well-rounded educational program. Predominantly black colleges are faced with the difficult task of reorganizing and strengthening their academic programs. In addition, improvement plans must be consistent with their goals and mission for existence. According to Shea (1974), there is now nearly universal agreement that we are in the middle of a new educational revolution, which may surpass in importance the industrial and political revolutions that preceded it. This revolution, in America especially, has been based upon the opening up of higher education to larger and larger numbers of people. McGrath (1965) looked at black colleges and recommended that black colleges take several steps in the immediate future if they are to compete satisfactorily with other institutions in the academic market place. He also states that in extending the boundaries of knowledge, all the predominantly black colleges need faculty members able and eager to keep their teaching in touch with the new knowledge being produced in their respective disciplines. Because of this black colleges need to raise their faculty salaries and to enhance the other perquisites of academic life if they are to be able to recruit and retrain teachers.

Although there are certain factors basic to each college, there are also peculiarities unique among them. Socioeconomic status of students, the composition of the faculty, location of the college, and purposes of the institution are but a few. Therefore, each college should evaluate its own program periodically to see if it is keeping pace with current changes and demands so frequently made upon its students. Epps (1974) states that the major constituent of any collegiate institution is its faculty. Institutions are judged by the quality of their faculty, and it stands to reason that the primary vehicle for improvement of the institutional program is through the quality of the faculty.

Some academicians are becoming worried about faculty development. A report issued by the Group for Human Development in Higher Education (1974) cited several salient concerns: the decline of academic mobility, the lessons learned from attempts at reform, and the call for accountability. Probably the remain reason for supporting a program of faculty development, however, is the effect it could have on the quality of teaching and thus on the morale of both professors and students.

A faculty development program cannot assume that the faculty will develop in new ways, however, the faculty can be induced to work harder. If faculty members do not like or do not know how to handle certain areas or disciplines, they can very easily sabotage a program. Faculty development can help to improve education in developing institutions. Some black colleges do not often have the training, resources, creativeness, motivation, and information that would facilitate improvement of teaching.

The Carnegie Commission on Higher Education (1971) states that higher education should take the major initiative in determining its own future. They have made many suggestions for action. Among them were: they should be more concerned with better teaching, with more effective curricula, and with all the other dimensions of academic quality—seeking more optimal modes of curricular organization and instructional presentation.

Higher education, above all, needs active faculty leadership pressing for better ways of doing things and greater achievements. Faculty members must be prepared to debate about fundamental purposes and to give more attention to matters of educational policy, to the maintenance of academic standards, to the process of academic change, to methods of counseling and advising students, to ways of soliciting student advice about academic matter, and to the search for colleagues among women and members of minority groups.

Predominantly black colleges must continue to take a critical look at improving their curriculum in providing training, opportunities, and experiences in which job opportunities have opened for blacks. Weaver (1966) states that programs to strengthen the private black colleges and universities involve improved recruitment and better selection of students, constant improvement of faculties—which, incidentally, involves more than assembling Ph.D.s on the staff so as to achieve accreditation.

According to Hodgkinson (1974), a large proportion of faculty development funds went for National Teaching Fellows (NTFs): 42 direct-grant institutions report having NTFs at a cost of either less than $20,000 (24 institutions) or between $20,000 and $49,000 (18 institutions).

The reasons for using NTF's were: (a) they help improve the existing curriculum and the quality of teaching, (b) they free regular staff members for advanced graduate study, and (c) they bring in fresh approaches and ideas to teaching.

A number of the institutions made in-service training opportunities available for their faculty. In-service training was geared to institutes, workshops, and consultant use. The participation was high due to the fact that the institutes and workshops were located on the various campuses.

Only 14 responding institutions received Title III funds for faculty development in 1966-67, 11 of which received less than $20,000. The improvement of the existing curriculum and quality of teaching were the most helpful aspect of the program.

Some of the institutions indicated that the in-service programs were unsatisfactory, because the faculty did not seem to acquire new skills, enthusiasm, or insight as to the nature of their work.

Advanced graduate training was used by faculty in all fields. Leaves of absence for advanced graduate training were granted to faculty planning to earn the doctorate. However, some of the institutions indicated that a combination of M.A. and Ph.D. was the primary degree earned.

There is no doubt that this program was seen by many as the single most important assistance provided by Title III. The perpetuation of improvements, however, wrought by Title III staff will rest with those faculty members who stay at the institution for an extended period of time.

Sample

A purposive sample of 34 developing institutions was selected to participate in the study. Thirty institutions were recipients of faculty development grants between 1969 and 1974. Of the 30 institutions receiving faculty development grants, 103 recipients from 16 institutions completed the questionnaire. Usable responses were obtained from 84 respondents who were granted study leaves under Title III. Respondents represented a cross-section of public and private institutions as well as two-year and four-year colleges.

Data Collection and Analysis

The data collection method consisted, mainly, of mailed questionnaires to these selected institutions. It was requested that five questionnaires be completed by faculty members who returned to the sending institutions and five faculty members who did not return, if any. The questionnaires were mailed directly to the Director of Institutional Research for the proper distribution. After the month and a half deadline, follow-up telephone calls were made to all the participating institutions.

Questions pertaining to current status, (returned or non-returned), grant receiver, completed degree, what degree completed, position before and after degree, and the increase in rank and salary were used. The instrument also tapped variables such as personal education expense and reasons for return or non-return to sending institutions.

All data were analyzed by chi-square test of independence. The probability level for rejecting all test of independence was set at $p < .05$ level of confidence.

Research questions of concern in the study were as follows: (a) was there a relationship between degrees completed and current positions and status? (b) was there a relationship between degree completed and promotions? (c) was there a relationship between degree completed and personal income expenses on graduate study? and (d) was there a relationship between personal income expenses on graduate study and current position and status?

Table 1.

FREQUENCY DISTRIBUTION OF FACULTY DEVELOPMENT GRANT RECIPIENTS PREVIOUS AND CURRENT POSITION FOR DEGREE PROGRAMS COMPLETED AND DEGREE PROGRAMS NOT COMPLETED

Title	Degree Program Completed				Degree Program Not Completed			
	Previous Position		Present Position		Previous Position		Present Position	
	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Instructor	13	28	6	13	12	33	8	22
Assistant Professor	20	43	3	6	12	33	8	22
Associate Professor	2	4	10	22	2	6	4	11
Professor	0	0	3	6	0	0	0	9
Department Chairman	3	6	10	22	2	6	3	9
Administrator	9	19	13	27	6	16	6	17
No Response	0	0	2	4	2	6	7	19
Total	47	100	47	100	36	100	36	100

Results

Faculty development grants were awarded to 84 respondents of which 47 completed their degree programs and 36 did not. The distribution of degrees obtained were 31 doctorates, 14 masters and one masters plus 30 hours. Of respondents not completing their degree, 5 were in the process of writing or defending their dissertations and 31 gave no indication of completing their degree programs.

The first research question was concerned with the relationship between degrees completed and current position and status. A distribution of respondents who received faculty development grants were shown in the table by previous and current positions. As indicated in the table, respondents held similar position prior to their faculty development study leave. However, respondents who completed their degree programs obtained more promotions in rank than respondents not completing their degree program.

Current position was significantly related to degrees completed. The obtained chi-square was equal to 12.01, df5, $p \leq 05$. The data indicated that respondents who completed their degree programs were more likely to obtain new positions than respondents who did not complete their degree program. Previous position was independent of degree completion suggesting that faculty mobility was directly related to degree completion.

Current status (return and non-return) was independent of degree completion suggesting that respondents receiving degrees were as likely to return to their sponsoring institutions as respondents who did not complete their degrees. It should be pointed out that 58 respondents returned to their institutions and 11 did not return. For the 11 who did not return, 5 received their degrees and accepted better job offers. Two did not complete their degrees and accepted higher paying jobs.

The second research question was the relationship between promotions and degrees completed. Promotions were assessed as increased salaries and promotions in rank. The obtained chi-square values were equal to 18.38, df, $p \leq 05$ and 12.25, df1, $p \leq 05$, respectively. The data suggest that faculty members who received their degrees were rewarded with increased salaries and promotion in rank. Comparing salary and rank it was found that 66 were given salary increases and 14 were not. Examining respondents by rank, it was found that all who received promotion in rank received accompanying pay increases and 21 of those not receiving increases in rank received accompanying pay increases. The obtained chi-square value was equal to 19.13, df1, $p \leq .05$. The data strongly suggest that colleges lived up to their commitment to faculty members who took advantage of faculty development study leave.

The third research question was related to personal income expended by faculty in the pursuit of their degree. Although some faculty members indicated that they had to supplement their grants, degree completion was independent of personal income expended. The data suggest that faculty members were sufficiently motivated to complete their degree in spite of additional personal expenses.

Summary and Conclusion

Faculty development grants were awarded to 84 faculty members of developing institutions of which 47 have completed their degrees. Faculty members completing their degrees were rehired by sponsoring institutions in new positions reflecting increases in salary and rank. Grant recipients who did not complete their degree program were as likely to return to their sponsoring institution as faculty members who completed their degrees. Faculty returning to their sponsoring institutions frequently cited family ties, obligation to the institution, and need to improve the education of their students as reasons for returning. Faculty members not returning to their sponsoring institution obtained other jobs in the teaching professions suggesting that although their sponsoring institution did not directly benefit from their educational experience, higher education benefited. The reason most frequently cited for not returning was better job offers. Some of these went to other developing institutions, larger white universities, and public school systems. It would appear that the attrition rate for non-returning faculty is below that which would be expected to occur by chance alone. It may be concluded that for the majority of those receiving grants, they would complete their degrees and return to their sponsoring institutions, thus improving the quality of education offered at developing institutions.

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A DYNAMIC SYSTEM FOR ADJUSTING FACULTY TEACHING BEHAVIOR AND UNIVERSITY GOALS IN THE GENERAL EDUCATION CURRICULUM

Donald F. Lawson and J.R. Cunningham,
Humboldt State University

The objective of this paper is to describe an interactive system designed to both (a) establish proper and operationally workable goals for the general education curriculum[1] at Humboldt State University (HSU), and (b) modify instructor behavior in such a way that these goals are achieved within the classroom. The intent is that through interaction both goals and instructor behavior are open to modification. As is the case in many new adventures, progress is slower than anticipated. According to early planning, the system should have been in its second cycle at the time of this Forum and, therefore, evaluation could be made of the entire process. Such is not the case. The first cycle is yet to be completed. Data on the process and observations concerning its results are, thereby, limited.

Goals

During the 1972-73 academic year the University Curriculum Committee established three goals that every general education course was expected to meet. These were rather ivory-towered goal statements of minimum course objectives that expressed the Curriculum Committee's beliefs as to what general education is and what it should do. Every department offering general education courses had to agree to what was virtually a contract with the University Curriculum Committee that their general education courses would achieve these goals. Two critical questions became evident: (a) were these realistic and appropriate goals? and (b) were these goals being achieved within the classroom? This initiated the study which resulted in a dynamic system for adjusting both faculty teaching behavior and university goals in the general education curriculum.

The three principles that the University Curriculum Committee imposed upon each course in the general education curriculum were:

1. That students be "actively engaged" in the approach to the subject: that they be required to apply concepts, skills, or capacities basic to the course—thus using their intellectual, imaginative, or other powers.
2. As corollary to the first principle, that this involvement should help the student become aware of the strengths and weaknessess of disciplined thought as a means of ordering human experience.
3. That the course should give the student some idea of how the discipline in which the course is offered (i.e., history) is related to the general area in which the discipline falls (i.e., social sciences), or to academic inquiry as such.

The Pilot Test

During the Fall Quarter, 1973, a pilot study was conducted in selected general education classes which secured information from both instructors teaching the general education courses and students taking these courses regarding the goals and their level of achievement in the classroom. Evaluation of this information, the data collection instruments, and the information collection mechanism added new perspective and led to revision in both the instruments and the mechanism.

Statements of goals were sent to a random selection of professors teaching general education classes. They were asked to respond regarding the extent to which their courses were meeting the three goals. Students in these classes responded to 17 survey questions related to the 3 goals to determine if they felt the goals were being met. A chi-square test was used to select the items for the final form of a student questionnaire to be used in future evaluation of the general education curriculum. Eleven items were included in this final version:

1. This course encouraged me to be either actively inquiring or creative in relation to the subject matter.
2. This course encouraged me to relate the basic assumptions and concepts to those of other fields of study.
3. I was encouraged by the nature of this class, to acquire and apply the concepts, skills or capacities basic to it.
4. As a result of this course, I perceive more clearly how the intellectual approach can lead to an understanding of experience.
5. This course encouraged me to apply and test the ideas or principles developed in relation to the subject matter.
6. As a result of this course, I have become aware of the limitations of disciplined thought in dealing with the subject matter.
7. This course encourages students to think and act creatively.
8. My ability to think critically in the area of this course has been increased.
9. The basic concepts and terms used in this course are now a part of my working vocabulary.
10. I have acquired viewpoints and skills which are helpful to me in my thinking about other subject areas.
11. I am able to use the principles and concepts of the course in my day-to-day contacts with other people.

Questions 1, 3, 5, 7, 8, 9, and 11 relate to goal number one, 4 and 6 to goal two, and 2 and 10 to goal three. Response options were (a) not applicable or don't know, (b) strongly agree, (c) agree, (d) disagree, and (e) strongly disagree.

The Interactive Evaluation System

The interactive evaluation system forms a loop. In the first part of the loop the University Curriculum Committee establishes the goals and makes the contract with the teaching departments. The second part of the loop is the student survey. The third part of the loop is the feedback of this information to both the University Curriculum Committee and the instructors involved. In the third part of the loop the results are returned to the Committee. They are analyzed class by class to determine if the goals are being achieved. Four subcommittees of the University Curriculum Committee have been formed to discuss these results with individual instructors. Each subcommittee is comprised of three committee members, the evaluation specialist in the Office of Institutional Research, and four faculty from the participating area. These discussions relate to both the realism and relevancy of the goals and the achievement of the goals in the classroom. The subcommittees were formed because of the need to interpret the results of the program-wide survey of the general education program, but the intent is wider in scope. The subcommittees should initiate a continuous dialog with the faculties and academic administrative entities responsible for instruction in the program that will ultimately be helpful to the University Committee in its evaluation of the program as a whole, its conception and design, as well as the individual parts thereof.

The expected value to the University is to establish sound educational goals in the general education curriculum; to change classroom behavior when and where appropriate; to enable teaching faculty to become more aware and knowledgeable in regard to the goals of general education as far as the Curriculum Committee is concerned; and to make the University Curriculum Committee aware of the difficulties that some course have in meeting these goals—and the appropriateness of mandating that all courses meet all of the goals. This system should facilitate realism in goal-setting and improve the general education program at the University.

The University Curriculum Committee has a concern that the evaluation of the program have a formative and constructive effect on it. The approach and attitude of the subcommittees should be one of mutual exploration of means of evaluating the program which will lead to its being strengthened in conception, design and implementation. The revision of the general education program has aimed at instilling a spirit in the program, and the chief potential benefit of the

Table 1

SUMMARY OF RESULTS

ITEM 2 (GOAL 3) THIS COURSE ENCOURAGED ME TO RELATE THE BASIC ASSUMPTIONS AND CONCEPTS TO THOSE OF OTHER FIELDS OF STUDY.

	(Spring '74)			(Winter '75)		
Course	**Agree**	**Disagree**	**Sig**	**Agree**	**Disagree**	**Sig**
University	754	293		1279	423	
111 (2W)				42	4	+1%
311				7	20	−1%
312				14	15	−1%
315 (3W)				22	15	−5%
316				16	0	+5%
322 (10W)				111	52	−%
323 (3S-5W)	25	18	−5%	49	36	−1%
331				80	13	+%
341 (4S)	60	57	−1%	17	28	−1%
362	8	9	−5%			
366				15	0	+5%
411				79	10	+1%
511				29	24	−1%
541	50	8	+1%			
551	25	1	+1%	36	0	+1%
561				13	0	+5%

Summary of Significant Differences by Sections

	Spring '74	**Winter '75**
−1%	4 (9%)	9 (12%)
−5%	4 (9%)	13 (18%)
+5%	0 (0%)	3 (4%)
+1%	2 (4%)	5 (7%)
Remainder	35 (78%)	44 (59%)

evaluation process is to communicate and maintain that spirit. This feedback and adjustment system is a mechanism for the Curriculum Committee to better understand classroom instruction and for the instructor to get a better idea of the goals and spirit of general education as conceived by the Committee.

No records are kept of subcommittee deliberations, and there are no implications for tenure or promotion. This feedback and adjustment system is simply a mechanism for the Curriculum Committee to better understand classroom instruction and for the instructor to get a better idea of what the Curriculum Committee means in its goals statements.

Analysis of the Data

The student survey consisting of 11 questions referring to the 3 goals of general education was administered twice—once in the Spring term, 1974 and again during the last week of the term during Winter, 1975. The data were analyzed using chi-square and reported to the Curriculum Committee. The reported data was concerned with only those courses which were significantly different from the all university response. The differences were considered to be in the positive direction if there were a greater number of responses in the courses agree category than would be expected from the all university response. The negative direction was defined in the same way with the expected number being greater in the courses disagree category.

Tables 1, 2, and 3 are to be read as follows: the item number refers to the item number in the student questionnaire. The goal number refers to the goals as stated by the University Curriculum Committee. The total university response is presented on the first line of the table. The numbers in the course column refer to individual general education courses. The numbers and letters in parenthesis indicates how many sections of this course were surveyed in the Spring (S) or Winter (W) survey. The agree and disagree columns indicated the actual number of students responding to each alternative. The column labeled Sig indicates the level of significance using a chi-square analysis and the + or − sign indicate the direction of that significance level when the course responses were compared to the all university response.

These data are potentially valuable, but only if interpreted with the aid of the faculty offering the courses and for formative rather than terminal evaluations. For example, course 311 is an historical survey course which appears to meet none of the three general education goals during the Winter Quarter, 1975. This leads the subcommittee into a discussion with the instructor of this course to attempt to determine his goals for the course and how they differ from the general education goals. Recall that each department on the campus has agreed that its approved general education courses will meet the goals of general education as defined by the University Curriculum Committee. Perhaps he is a new instructor who has not been fully oriented or the defined goals may be inappropriate for that course.

Table 2

SUMMARY OF RESULTS

ITEM 4 (GOAL 2) AS A RESULT OF THIS COURSE, I PERCEIVE MORE CLEARLY HOW THE INTELLECTUAL APPROACH CAN LEAD TO AN UNDERSTANDING OF EXPERIENCE.

	(Spring '74)			(Winter '75)		
Course	**Agree**	**Disagree**	**Sig**	**Agree**	**Disagree**	**Sig**
University	687	312		1144	405	
111	22	3	+5%			
312				15	13	−1%
315 (3W)				15	12	−5%
312 (10SW)	55	42	−1%	91	51	−1%
341				26	19	−1%
362	5	11	−1%			
363	4	9	−1%			
366				14	0	+5%
411	31	25	+5%			
541	50	10	+1%			
551	21	2	+5%	29	3	+5%
564				31	1	+1%

Summary of Significant Differences by Sections

	Spring '74	**Winter '75**
−1%	12 (27%)	12 (16%)
−5%	0 (0%)	3 (4%)
+5%	3 (7%)	2 (3%)
+1%	1 (2%)	1 (1%)
Remainder	29 (64%)	56 (76%)

It is known, by the program evaluation, that the instructor for course 564 made a concerted effort between the time of the two surveys to change his course objectives so they corresponded to the objectives of the Curriculum Committee. Tables 1 and 3 indicate that he has been successful, at least in the eyes of the students, as indicated by their responses to the two questionnaires.

A chi-square test of the total university response to each of the 11 questions was done on the Spring, 1974 and Winter, 1975 surveys. No significant differences were found between the 2 administrations on any of the 11 questions which indicates that the 11-item questionnaire has some degree of reliability. Several of the questionnaire items contain a high percentage of responses in the tails (see Table 3). This should raise some questions for the Curriculum Committee concerning the general applicability of these items to all courses. This is particularly true when the individual courses are examined—they group nicely by course characteristics. Or, possibly, these departments should be concerned with this item, but resist or do not perceive the possibilities for attainment for some reason. Adjustment, either in teaching behavior or application of the item, seems inevitable if the interactive process is successful.

Evaluation of the System

The system for adjusting faculty teaching behavior and university general education goals can be conceived as a feedback system. Even though a complete feedback and adjustment cycle has not yet been formally completed, preliminary evidence suggests that the process will result in the desired types of adjustments. One professor who taught the same course in both of the survey quarters (course 564) took it upon himself, after the first survey, to discuss the results with the evaluator. His course scored on the negative tail for 5 of the 11 items, with the rest being non-significant. He overtly tried to alter his course to better meet the goals. In the following survey four of these five items moved into the non-significant group, with one remaining on the negative tail (and even here the course improved in a positive direction—see Table 3). Another item moved into the positive tail from the non-significant group and one item moved from the non-significant group to the negative tail. Definite progress had been made in meeting the goals as measured by the questionnaire items.

To the knowledge of the evaluation specialist, no other instructor had evaluated his results in the first survey. It must be recognized, of course, that the evaluation system is relative

Table 3

SUMMARY OF RESULTS

ITEM 11 (GOAL 1) I AM ABLE TO USE THE PRINCIPLES AND CONCEPTS OF THIS COURSE IN MY DAY-TO-DAY CONTACTS WITH OTHER PEOPLE.

	(Spring '74)			(Winter '75)		
Course	**Agree**	**Disagree**	**Sig**	**Agree**	**Disagree**	**Sig**
University	603	420		1010	505	
121 (2S-6W)	20	3	+1%	82	23	+1%
211 (3S)	51	21	+5%			
311				5	17	−1%
312	3	12	−1%	9	21	−1%
315 (3W)				14	17	−1%
322 (10W)				79	68	−1%
323 (7S-5W)	44	55	−1%	45	38	−1%
331				70	17	+1%
341 (4S)	46	69	−1%	16	29	−1%
361 (3S)	43	8	+1%			
362 (4W)				69	5	+1%
366				12	0	+1%
411	28	34	−5%			
511				23	32	−1%
531	21	4	+1%	34	2	+1%
564	11	20	−1%	20	20	−5%
566				9	0	+5%

Summary of Significant Differences by Sections

	Spring '74	**Winter '75**
−1%	13 (29%)	22 (30%)
−5%	1 (2%)	1 (1%)
+5%	3 (7%)	1 (1%)
+1%	6 (13%)	13 (18%)
Remainder	22 (49%)	37 (50%)

and not absolute, and that there will always be significant differences no matter what the level of achievement.

Some discussions have been held with teaching departments since the second survey. Adjustments in thinking seem to be taking place regarding the goals as they pertain to specific courses and types of courses. It is quite possible that formal changes will take place. There are several weaknesses in the system. The student questionnaire is one. As is true of many questionnaires designed by committees, the compromising and editorial process by a cross-section of individuals, some of who have subject specialties not normally concerned with evaluative instruments and methodology, often results in a less than perfect device. One problem is that of terminology. It is quite possible that the students are answering a single question in varying ways, and in variance to what the Committee had intended in the question. For example, the phrase "disciplined thought" and its potential usefulness in the questionnaire was the subject of considerable discussion by the Committee. Although the Committee recognized the difficulty that students might have with the phrase, they could think of no generally acceptable substitute.

Another weakness is that the chi-square analysis using the collapsed cells is not as rigorous as it could be and the general education goals are stated in obtuse terms. Despite these limitations, it is felt that any system which results in serious discussion of teaching goals and behavior can only benefit faculty and students. Given the limited exposure to teaching strategies and goal statement and attainment received in most Ph.D. programs, the start on faculty development provided by this system must benefit both students and faculty.

Meetings of the Curriculum Committee and of those subcommittees that have met with faculty suggest that the system will work—time will tell. The concept appears sound, but people make it work.

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1. The general education program and the major are the two main elements in the undergraduate degree programs at HSU. Both share one central objective, to assist the student to develop the capacity for a disciplined examination of experience. The major provides the opportunity for this in depth, the general education program provides for it in breadth. In the general education segment the student must elect course work amounting to at least 12 quarter units in each of 4 introductory lower division areas and 20 unit programs in one emphasis area. The four introductory areas are (a) basic subjects (written and oral communication and critical thinking), (b) humanities, (c) science, and (d) social sciences. This system is concerned with the introductory areas.

THE CRITICAL INCIDENT TECHNIQUE IN EVALUATING COLLEGE TEACHING

Ann A. Rhodes and Roberta D. Brown,
Arkansas College

Faculty evaluation is one of the most explosive areas in higher education today according to Miller (1972). Students want it. Administrators regard it as a necessity. Faculty have mixed feelings about it—some willing to take their chance and viewing it as a possible means of self-improvement, others regarding it as a threat and crying for "academic freedom." Legislators think it should be required. If this long-neglected and ultra-sensitive issue of faculty evaluation is not faced internally by the institutions, it may be forced by external agencies.

The problem needs resolution in order to satisfy the need for teachers to know whether or not they are presenting the optimum classroom learning condition, to promote optimum student achievement, and to furnish administrators a method of determining or predicting the degree of success in each classroom.

Although research into teaching effectiveness has been going on for years, a review of the relevant literature indicates that the results are tenuous, ambiguous, and in some cases, contradictory. Assessing the effects of teaching behaviors on students' achievement poses the problem of developing an easily administered, fair and impartial, reliable method for use by evaluators, administrators, and faculty. A recent research study sponsored by the U. S. Office of Education and carried out by its Regional Research Program (Ronan, 1972) shows some promise for having developed a reliable evaluation device, the Critical Incident Technique.

The Critical Incident Technique has been used in industry over a period of two decades. Recent studies are beginning to apply the technique in the educational setting. Basically, the method consists of collecting information from persons who have occasion to regularly observe performers at their job. These observers are asked to describe incidents which characterize, in their opinions, either particularly effective or ineffective performance.

In the educational setting, the approach concentrates on the unique point of observation by a student as opposed to that by an evaluator who may have preconceived ideas concerning appropriate and inappropriate behaviors. The student sees the world of instruction day by day and week by week and is sensitive to the instructor in a way that results in achievement levels that vary with each instructor's methods and behaviors.

This study builds upon the previous research done at Georgia Institute of Technology, Atlanta (Ronan, 1972), where students identified some 3,000 incidents describing "best" and "worst" teachers. These incidents were categorized into behavioral areas describing the dimensions of effective and ineffective teaching. The current study used this taxonomy as a basis for evaluating teaching effectiveness.

The purpose of the study was to field test the Critical Incident Technique (CIT) for assessing college teaching effectiveness as an alternative to traditional rating forms. Rankings of teaching effectiveness obtained by using the Critical Incident Technique were compared with those obtained using a rating instrument, the Student Instructional Report (SIR) (Educational Testing Service, 1973). Further, the ease of administration and problems incurred in use of the particular sampling and interview techniques employed in this study were assessed.

Method of Procedure

A questionnaire, utilizing in random order 72 descriptions of teacher behavior from the taxonomy developed in the U. S. Office of Education study (Ronan, 1972), was administered through interview to a sample of college students during the spring semester 1974. Junior level behavioral science students enrolled in a course in directed research served as interviewers. They were instructed in the philosophy of the Critical Incident Technique and in interviewing procedures to insure comparability of conditions under which data were obtained. In initial interviewing, they worked together until a reliable pattern of reporting results was established.

The sample consisted of approximately one-fourth of the total student population and included an approximately equal distribution of males and females, commuters and residents, and students from each classification. Additions to the initial sample were randomly selected from a separate listing to insure that part-time instructors were evaluated by at least three students.

Students were asked to respond to the 72 items in a Yes-No format. "Does any professor you have during the current semester exhibit the following behavior?" In case of a "Yes" response, the student was asked in which class or classes the observed behavior occurred. From these responses a rank ordering of instructors was developed by subtracting the number of reported negative behaviors from the number of reported positive behaviors to arrive at a score for each instructor. The behavior was considered to have occurred if two or more students reported having observed it.

These rankings were compared by rank order correlation coefficient with total rankings obtained from summing and averaging weighted means of responses to a section of the Student Instructional Report. Approximately 2,000 student responses from fall administration of this instrument in more than half of the classes were available for comparison.

So that other factors associated with administration and use of results from the Critical Incident Technique could be analyzed, interviews completed a brief form after each interview, listing the time taken for the interview, a rating of the openness or hesitation of the respondent, and the student's view of which was the easier and more effective instrument. Further, the faculty were asked to indicate in written form which instrument provided them with the most helpful information for understanding their own teaching effectiveness and

Table 1

COMPARISON OF RANKING BETWEEN CIT AND SIR

Professor	CIT	SIR	Professor	CIT	SIR
X01	1	18.5	X17	16	18.5
X02	2	18.5	X18	19	14
X03	3	23.5	X19	19	18.5
X04	4	1	X20	19	4.5
X05	5.5	23.5	X21	21.5	4.5
X06	5.5	9.5	X22	21.5	18.5
X07	7.5	2	X23	24.5	27.5
X08	7.5	23.5	X24	24.5	31
X09	9.5	14	X25	24.5	29
X10	9.5	9.5	X26	24.5	23.5
X11	12	23.5	X27	27.5	27.5
X12	12	4.5	X28	27.5	9.5
X13	12	9.5	X29	29	9.5
X14	14	14	X30	30	30
X15	16	9.5	X31	31	23.5
X16	16	4.5			

ρ = .38, significant at .05 level.

Table 2

STUDENT ATTITUDE RATINGS DURING CIT EVALUATION

Attitude Scale	Number	Per Cent
Open and Cooperative	60	80
Mildly Hesitant	14	19
Hesitant or Overcautious	1	1
Uncooperative	0	0

N = 75

for considering alternative teaching approaches.

In summary, the objective of this research was to compare the Critical Incident Technique with a survey instrument such as the Student Instructional Report and to investigate the advantages and disadvantages of the technique as an evaluation device. Questions considered by this research included:

1. Do the rank orderings of "good" to "poor" teachers obtained from using the two instruments significantly correlate at the 5% level?
2. Which instrument is easier to administer?
3. Which instrument provides the more helpful feedback to professors?
4. Does the CIT provide sufficient information upon which administrative decisions may in part be based?

Summary of Findings

Question 1. Do the rank orderings of "good" to "poor" teachers obtained from using the two instruments significantly correlate at the 5% level?

The Critical Incident Technique and the survey instrument, Student Instructional Report, apparently measure some of the same dimensions of effective teaching. When rankings of professors obtained by subtracting observed negative behavior patterns from observed positive behavior patterns according to the CIT are compared with rankings obtained by summing and averaging weighted means of 18 items describing teacher behaviors and course organization from the survey instrument, the results are found to be significantly correlated at the 5% level.

At the time of the interview, the interviewer rated the student's attitude on a scale from open and cooperative through hostile and uncooperative. With 80% rated as open and cooperative, as shown in Table 2, there is no reason to conclude that students' attitude toward the evaluation technique biased results.

Question 2. Which instrument is easier to administer?

The Critical Incident Technique could be administered in the same manner as the survey instrument; that is, students

Table 3

FEEDBACK HELPFULNESS OF CRITICAL INCIDENT TECHNIQUE AS VIEWED BY FACULTY

	CIT		SIR		An Instrument to be Locally Devised	
	Number	Per Cent	Number	Per Cent	Number	Per Cent
Which instrument provided most helpful information for understanding your own teaching effectiveness?	14	70	6	30		
Which set of results offered most helpful information for considering alternate teaching approaches?	13	65	7	35		
Which instrument would you rather see used for teaching evaluation during 1974-75?	10	50	3	15	7	35

in each class to be evaluated could be asked to complete a written survey describing teacher behaviors. Under these conditions, administrative time and costs would be similar. However, in this study time spent in sampling, interviewing, and tallying results is compared with time and costs of administering some 2,000 survey questionnaires and scoring responses. The time consumed to accomplish each interview was recorded and found to require, on the average 19.8 minutes, with 10 minutes the minimum time and 40 minutes the maximum. This is considerably less than was required to administer 2,000 surveys and process results.

Students and faculty were both asked to rate ease of administration. For the CIT, some students in the sample were called from the classroom; for the SIR, administrations were made in the classroom. Tabulation of the ratings shows that 65.4% of the students and 100% of the faculty considered the CIT easier and less disruptive.

Question 3. Which instrument provides the more helpful feedback to professors?

Twenty of the 31 professors participating in the experiment returned a questionnaire sampling their attitudes toward the Critical Incident Technique. A majority of those responding rated it more helpful than the SIR, the standard instrument, for understanding their own teaching effectiveness and for considering alternate teaching approaches. The CIT was favored over the SIR and an instrument to be locally devised as the instrument to be used for teaching evaluation during 1974-75. Table 3 provides the figures on faculty attitudes.

Question 4. Does the CIT provide sufficient information upon which administrative decisions may in part be based?

A word of caution should be inserted at this point. The rankings referred to elsewhere in the report were made simply to provide a basis for statistical comparisons between the two techniques. Certainly for the purpose of improving teaching and counseling with faculty, it is more useful to deal with each of the separate dimensions of behavior rather than with some undimensional "score." Still it may be valid to take an administrative look at the clustering of single scores. Figure 1 provides such a view.

Three groups are discernible. Most of the professors are considered to be excellent or acceptable. The isolated case of possible ineffective teaching could receive special attention. This professor could be given special help and opportunity to improve performance by going over the various specific behaviors on the CIT. If other measures of teaching effectiveness correlated with student observations recorded on the CIT and if the professor failed to improve over a period of time, a terminal contract could result.

Conclusions

The general conclusions arrived at by this research indicate that the Critical Incident Technique should be favorably

Figure 1

CIT "SCORE" FREQUENCIES

SCORE	FREQUENCY
.	
.	
.	
37	1
36	1
35	1
34	1
33	2
32	3
31	2
30	3
29	2
28	3
27	
26	
25	4
24	2
23	4
22	2
21	1
20	1
19	1
18	
17	
16	
15	
14	
13	
12	
11	1
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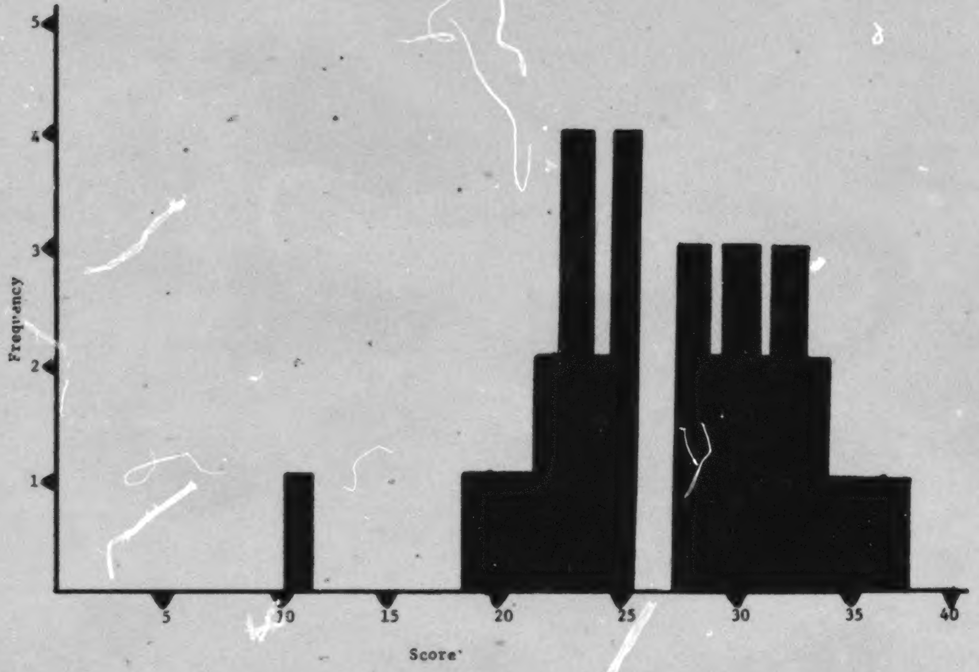
Median	28
Mode	25
Range	27
Mean	26.6



considered as a method which produces reliable results with a minimum of classroom disruption and considerably fewer administrative problems than the typical survey instrument. It is well received by both students and faculty and requires no complex formula to arrive at an individual profile of behaviors positively or negatively affecting student attitude and achievement.

A further advantage of the CIT method as an evaluation technique is its objectivity. The student has an opportunity to report on only what he has observed, and no implications need be pondered. Tendencies to personalize the consideration of a response are eliminated; the responses are virtually spontaneous and probably reflect a high degree of reliability. The need for abstract interpretation of words is reduced measurably by keeping the questioning simple; either the behavior has been observed in the classroom or it has not.

A refinement of the CIT might be obtained by permitting the student to respond on a graduated scale. Did the behavior occur (3) frequently, (2) occasionally, (1) not at all?

A need for further research is indicated in order to develop a taxonomy of teaching behaviors applicable to the unique situation of the local campus. It is probable that the degree of acceptance of the validity of a taxonomy of behaviors will be directly related to the degree of participation of those being evaluated in the selection of those behaviors isolated for inclusion.

The reliability of the technique needs to be checked through a test-retest procedure and through comparison with other student ratings.

In at least one study (Douglass, 1968), teacher behaviors have been shown to be predictive of student achievement. Additional research is needed to validate the instrument and to relate student achievement measures with teaching behaviors. Comparisons should also be made between CIT ratings and ratings of teaching effectiveness by the professors' supervisors.

In summarizing, from the research conducted, it can be stated that the two instruments tested do have a significant degree of correlation and that the CIT proved to be easier to administer and was determined to be more acceptable and helpful by both students and faculty. The problems incurred in sampling and interviewing were not sufficiently important to warrant rejection of the technique, and the use of personal interviews to gather data created a responsive attitude in students. Certainly additional research seems justified.

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FACULTY DEVELOPMENT IN HIGHER EDUCATION: FROM MYTHS TO RESEARCH FINDINGS

Robert G. Simerly, Syracuse University

The fact that we lack an adequate knowlege base about how college teachers grow and develop professionally has been noted by Knapp (1965), Mayhew (1969), and Milton and Shoben (1968). We know little about why people are motivated to become college teachers. And once they have entered the academic ranks, we know little about how faculty members develop, why they choose to stay in higher education, or why they choose to leave. Surprisingly a comprehensive survey of nationwide faculty development programs has not been done. Recently, however, Gaff and Wilson (1971) reported that the American Association of University Professors (AAUP) asked subscribers to *Academe*, the AAUP newsletter, to indicate whether or not their institutions had faculty development programs. Only 6 of the 150 responses were affirmative.

The Need for Planned Faculty Development

In today's rapidly changing world faculty members and administrators in higher education must begin giving conscious, deliberate attention to the concept of faculty development. In a pre-cybernetic communications era faculty members did not need to give extensive planned consideration to their continued learning and development because new knowledge was introduced slowly into society. However, in today's cybernetic communications era change is rapid. The half life of knowledge in some disciplines is estimated to be between five and ten years. Therefore, as Gustad (1969) points out, simply maintaining competency in one's own discipline is an overwhelming task for faculty members.

Today professors are caught in the difficult position of increasingly having to spend additional time at just maintaining their expertise, while society demands that they also generate new knowledge as well as constantly improve their abilities at teaching and public service. When professors find it difficult or impossible to meet these demands, the charge often is that the quality of teaching is declining and that professors are not adequately continuing their professional development.

Teachers and Teaching—Some Basic Assumptions

The assumptions on which faculty members base their professional roles are central to the issue of faculty development. Wilson (1972) charges that the faculty believe that it is their job to teach the students a particular discipline. Certainly the traditional organization of faculties into departments that tend to be concerned with a particular discipline has tended to encourage this viewpoint on the part of the faculty. Thus, often the large university has become overcompartmentalized which, in turn, encourages a rigidity that does not easily facilitate communication from one discipline to another. As a result, Litchfield (1959) and others have pointed out that an organic view or a view of the institution as a whole is often not encouraged.

In addition, the long history of faculty independence has tended to create a laissez-faire faculty system. The individual freedom of faculty members is jealously guarded and anything that approaches a tampering with this freedom is viewed as dysfunctional by large segments of the academic community. This, in turn, has led to the ultimate in faculty independence that traditionally has been established in the tenure policy. Once faculty members attain tenure it is usually possible for them to perform their duties with little or no evaluation or input from the publics that they serve. This lack of concern for encouraging faculty members to be accountable to the publics that they serve in their professional roles has come to be known as academic freedom. Honey (1972) has noted that we assume that this laissez-faire system works in the best interests of students. However, the student protests of recent years along with today's public demands for accountability and competency-based programs have seriously questioned this assumption.

Schein (1970) feels that it is the socialization process that has created the autonomous role traditionally ascribed to college teachers. The rigors of a doctoral program condition students to view graduate education as a series of hurdles to be jumped without question. Thus we produce experts whose behavior can only be questioned by someone who is more of an expert.

Closely related to this is the important assumption generally held about faculty members in higher education. We assume that the development of expertise in a subject area implies expertise in learning theory. However, there is a notable lack of exposure to learning theory in many of the educational programs designed to prepare individuals for teaching careers in higher education.

Also there are discrepancies between rewards and aspirations in the college teaching profession. Gustad (1959) notes that teaching is generally not rewarded by the higher education organization. While it may be difficult to obtain conclusive proof regarding the rewarding of teaching, faculty perceptions of the problem have been obtained. For example, the Gaff and Wilson (1971) study showed that most individual faculty members responded that they valued good teaching. Yet these same respondents did not feel that good teaching led to advancement in their respective institutions. Chances for advancement were perceived by faculty members to be based almost solely on research resultant in publication. However, as Cartter (1966a) has noted, the majority of faculty do not publish. Mayhew (1971) confirms the fact that the majority of faculty members do no research and publish no papers. In fact, he sees a definite value-conflict among publishing, teaching, and consulting that is significant in a faculty member's development.

The reward or lack of reward for teaching performance is complicated by the fact that we do not have an adequate means for judging teaching excellence (Cartter, 1966b). Good teaching is usually discussed as a distinct act that is not necessarily related to learning. Thus the myth has evolved that good teachers have developed and refined certain teaching traits or skills. This implies that these traits or skills can be transferred from one teacher to another without directly relating them to the learning process. The major problem concerning the teaching-learning controversy is that we do not have an adequate knowledge base to show that what a teacher does in the classroom makes a significant difference in student learning as measured by the traditional ways we now measure learning. This points out the complexity of the cause-effect variables in the learning situation. Traditionally we have assumed that students have learned because they were "taught" by a teacher. Milton (1972), however, succinctly points out in *Alternatives to the Traditional* that the variables involved in the teaching-learning process are so complex that our present research methods have not been able to relate teaching behaviors to changes in student behaviors. Therefore, it is impossible to talk about improving teaching until we can identify those behaviors that need to be improved in order to lead to learning outcomes in students.

Faculty Development—Defining the Problem

A major problem in discussing faculty development is a semantic issue. Agreement on what actually constitutes faculty development has not been reached. Is development concerned only with new techniques or methods? Does it include the way one is socialized into the profession? Is development the same thing as training?

For the purposes of this paper, *faculty development can be thought of as giving conscious attention to planning, studying, and improving the processes used by faculties to attain goals they establish or that are established for them by the organization or by outside publics such as state legislatures.* Thus, faculty development is not necessarily a specific program or a set of programs. Rather it is a process that is in a constant state of change as it operates for the individual and for groups.

With this working definition of faculty development, this researcher designed a study that attempted to ascertain how faculty members develop in their professional roles.

A Research Base for Faculty Development

Procedures. A major first step in studying faculty development in higher education was to find out how faculty members perceive their own professional development. In order to do this the faculty at a large state university with a student enrollment of 23,000 and a faculty of 972 was chosen for study. Initially a questionnaire was created to obtain information about faculty perceptions of their own growth and development. The reliability of the questionnaire was tested during interviews of approximately one hour each with a selected sample of the population to be studied. This attempt at instrument validation revealed that answers to questions regarding faculty development were often so complex, individualized, and diverse that it was difficult to obtain reliable data through a questionnaire.

As a result it was decided to abandon the questionnaire approach. However, this testing of the questionnaire did reveal that faculty members could respond verbally in a reliable way to questions concerning how they perceive their own development. These responses were generally centered around a common core of concerns. Therefore it was decided to use this common core of concerns as a basis for asking questions during subsequent structured interviews.

The sample. A 5% random sample of the 972 faculty members stratified by the 3 professional levels was chosen for the sample. This yielded a total sample of 45 with 15 professors in each of the 3 ranks of full, associate, and assistant professor. Three members of the sample elected not to participate in the study. Thus the *N* for the sample interviewed was 42.

The research design. Structured tape-recorded interviews of approximately one hour each were held with individual members of the sample. Direct quotes of the most pertinent information given in response to the questions were written down during listening sessions of the recorded interviews and two independent raters then read through the data and the classifications of data. Adjustments were made as necessary in order for the researcher and the two raters to reach agreement about data classification.

Thus, the study was exploratory in nature and it sought to ascertain faculty perceptions of their professional development process so that taxonomies of faculty development could be created. Specifically, the study sought answers to the following questions:

1. What changes in teaching techniques are professors making?
2. What causes these changes?
3. How are changes in teaching evaluated?
4. What are the environmental factors that help and hinder professional growth and development?
5. What are the perceived organizational rewards for teaching?
6. How is faculty performance evaluated?
7. What provisions exist for planned faculty development?

Research Findings

Changes in teaching. The changes that a faculty member makes in his/her teaching techniques are an integral part of faculty development. Therefore an attempt to ascertain changes in teaching techniques was made by asking the question, "Could you share with me a time within the last year or two or three when you made a change in your teaching style or teaching techniques that you felt resulted in your own professional growth and development as a faculty member?"

Early into the research it became clear that this question was based on a faulty assumption on the part of the researcher—that faculty members were initiating readily identifiable changes in their teaching. Most respondents had a very difficult time answering this question. Changes in teaching, when mentioned, fell into two major categories: (a) changes in the process that occurred in the classroom; (b) changes in products used in teaching, such as audio-visual aids and bibliographies.

Half of the sample (49%) indicated that they had made changes in their teaching process. These process changes all could be categorized as group involvement approaches to teaching-learning that de-emphasized the lecture approach. However, when pressed about the specifics of these teaching process changes, most respondents were abstract about the change and could not cite specifically how the process in their classroom or their behavior as a teacher had changed.

Changes in products used in teaching were easier to identify than process changes; however, respondents still had trouble recalling such changes. Such product changes included the following:

Percentage of Sample Mentioning Change	
1. Testing changes	19%
2. Use of audio-visual aids	16%
3. Type of assignments revised	14%
4. Course outlines changed	5%

Causes of change in teaching. The next step was to ask who was most responsible for these changes in teaching coming about. Organizational influences were listed by 40% of the sample as resulting in changes in teaching. Among the organizational influences were such things as interaction with colleagues, abolishing final examination week, and changes in the undergraduate curriculum.

Other reasons for change listed less frequently were:

Percentage of Sample Mentioning Reason for Change	
1. Students	19%
2. Self	16%
3. National trends	7%
4. Staff development activities	5%
5. Influences from previous schooling	5%

Evaluation of change in teaching. Change for change's sake occurs often in education. Therefore faculty members were asked how they had evaluated the success or failure of their stated changes in teaching. Subjective evaluation with no empirical data base was mentioned most often (70% of sample) as the method of evaluating change in teaching. Fully 19% of the sample stated that they had made no evaluation of their change in teaching.

Working environment and faculty development. The effect of the working environment is another important issue in faculty development. Environmental factors perceived by respondents as helping their growth and development were the opportunity to interact freely with colleagues. This was mentioned by 43% of the sample. In addition, the general freedom provided by the university atmosphere was listed by 40% of the respondents.

Negative factors that hindered faculty members' growth and development and mentioned by 39% of the sample centered primarily around the issue of not having enough time to excel in teaching, research, and public service.

Organizational rewards for teaching. This elicited rather clean-cut and often emotional responses. Most faculty members (77%) stated flatly that the organization did not reward performance in teaching. Associated with this was the fact that all of these respondents felt that the organization did reward research that resulted in publication.

Evaluation of faculty performance. The most common method of evaluation of a professor's performance was for the department head to fill out a rating form on the professor and then to discuss this with him/her. This was mentioned by 36% of the respondents. It is interesting to note that 21% of the sample stated that they received no formal evaluation. This is especially important in view of the fact that conversations with all deans within the university studied indicated that all faculty members received at least a yearly evaluation.

Existence of planned faculty development. Most departments did not give conscious attention to planned faculty development as reported by 74% of the sample. Another 14% of the sample was not sure whether their department had a planned faculty development program or not.

Summary of Findings

1. The idea of faculty members being experts in teaching-learning theory is a myth. Change for change's sake seems to be the norm for the sample studied. Changes in the teaching-learning situation are often abstract, vague, and not evaluated for their effectiveness.
2. Organizational influences at the employing university accounted for the majority of changes in teaching when they did occur.
3. The institutional working environment is seen as helpful for professional growth because of the freedom provided by the environment. However, this freedom also creates a dilemma of not providing enough time.
4. Most faculty members feel that the only way to advance in their profession is to do research that results in publication. Teaching performance is perceived to play little or no part in advancement.
5. The typical supervisor-subordinate evaluation in which the department head fills out a rating sheet on the faculty member and discusses it with him/her is the most commmonly used yearly method of evaluation of faculty performance.
6. Planned efforts at faculty development are almost non-existent.

Conclusions

The idea of planned faculty development in which attention is focused on articulating and planning ways to integrate individual and organizational needs and goals is not a part of the conceptual scheme of the majority of most faculty members in the sample. Individuals actively against planned faculty development tended to see such planning as interferring with their autonomy. For these professors there was a distinct aversion to having the organization participate in a formal way in this area. Respondents in this category definitely did not see planned faculty development as a positive support system for faculty. Neither did they view it as a negotiating process between the individual faculty member and the organization. Typical of such expressed feelings was the following statement by one professor:

> The minute the university starts trying to plan things for me that's the day when they can get themselves another professor. I'm not having any organization or any member of an organization telling me what I can and cannot do in the classroom or anywhere else. It's none of their damn business. That's how the university historically has gained its strength—by not allowing the organization to dictate to its faculty members.

It is interesting to note that the entire sample generally tended to view faculty development as a specific program that has a beginning and ending point. No respondent indicated that a planned faculty development program could be anything approaching a continuing, ongoing program in which the central issue would be to focus on the process of faculty development as opposed to specific content areas within the process.

FACULTY DEVELOPMENT

Implications for Institutional Center Research

Because of increasing public demands for accountability and competency-based education, the planning for the utilization of human resources within institutions of higher education has assumed an importance equal to that of planning for physical and financial resources. Thus, as institutional managers and researchers it is imperative that we conduct action-oriented research within our organizations regarding how we plan for and utilize the human resource of our faculty members.

We must create a data base that contains reliable information about how they grow and develop personally and professionally, how satisfied they are with the quality of life in their organization, what they know about the teaching-learning process, and how they help or hinder the teaching-learning process.

Therefore, in the decade of the seventies as we give more attention to accountability with responsibility, the following will be our top priorities for faculty development:

1. Alternative ways are needed to provide the most effective means of providing positive psychological support systems for faculty members as they develop.
2. Organizational climates need to be created in which the individual and the organization can devise ways to articulate needs, plan goals, and establish processes to work toward goals.
3. Reward systems should be geared to the dynamics of effectively developing, establishing, and participating in such a process.

We can no longer ignore the fact that we must research ways to actively plan for the continuing development of our faculty if our institutions for higher education are to remain viable in a rapidly changing world where the amount of knowledge is doubling every ten years. Viable educational institutions are changeable, renewable institutions. Changeable, renewable educational institutions must have changeable, renewable faculty members. We must now plan ways for this to occur rather than following our established pattern of leaving the development of our faculty members to change.

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ADMINISTRATIVE EVALUATION BY FACULTY

Charles H. Farmer and Elaine Mann,
University of Tulsa

One of the great comic scenes in literature, the birth of Laurence Sterne's *Tristam Shandy*, depicts the rage and frustration of a man-midwife as he attempts to untie the knots of his instrument bag while Tristam, upstairs, threatens to be born without him. Readers will recall, however, that complications occur and the frantic doctor finally severs the knots with a knife, cuts his thumb, and, in pain and haste, misapplies the forceps, drawing poor Tristam into the world with a smashed nose.

There are a number of warnings in this unfortunate episode for educators who contemplate a program of administrative evaluation by faculty. There is the possibility, of course, that one may engage in such painstaking theoretical investigations that the program finally bursts into the world without any professional assistance. It is more probable, however, that this complex issue will require extensive attention and that universities may be forced into using hastily conceived instruments and procedures, potentially damaging to individuals and institutions alike.

The Current State of Administrative Evaluation

That administrators, whatever their academic settings, are accountable for their performances no one would dispute. Most would concur also with Mortimer's (1972) view that "colleges have been and will continue to be under severe pressures for increased accountability to a variety of agencies and interests, including the general public, legislatures, governors, governmental agencies, the courts, governing boards, faculty, students, and other internal constitutents" (p. 1).

Traditionally, of course, the accountability flow has been upward through the pyramid structure of the university; conversely, evaluation has moved downward. The number of postsecondary institutions which have reversed the pattern of evaluation by formally including faculty in an upward assessment of administrators is small. The number of four-year institutions with such programs is smaller still. However, a tally of universities in which the question of faculty participation in administrative evaluation is being studied suggests that the subject is of current interest to individuals in almost every academic milieu. This interest has been demonstrated geographically from California to Massachusetts, Montana to Texas—structurally from large state systems such as Illinois to private institutions such as Loyola and non-traditional colleges such as Minnesota Metro.

Professionals in institutional research and planning would be well-advised to tackle the knots of the issue well ahead of local need. Those institutions which are experiencing serious difficulties in establishing a program for faculty evaluation of administration report a consistent sequence of events in which firm commitments, often statutory, have been made prior to practical planning. It is our position that theoretical deliberations concerning administrative evaluation should not only begin early, but also should be firmly grounded in practical considerations. These incude questions of who should be evaluated and by whom; what qualities and areas of performance should be included in the evaluation; how these factors can be accurately measured; and what purposes the results are intended to serve.

The Rationale Behind Administrative Evaluation by Faculty

Those universities and individual researchers studying faculty evaluation of administrators have usually become concerned with the issue in two ways. The majority have come to the subject through involvement in the larger process of institutional self-study. One of the effects of the pervasive urge for institutional self-consciousness has been a heightened awareness of the communal aspects of academic life. Internal studies involving goals and objectives, standardized instruments for measuring goal perception such as the Educational Testing Service Institutional Goals Inventory, and numerous national studies have all served to heighten local institutional awareness. Individual academic units are growing more conscious of their relationships with other units. This, of course, leads to a more vivid perception of the whole.

In such a climate the concept of administrative evaluation by faculty is fostered by an impulse, on the one hand, to perceive the institution as one large community of scholars in which mutual interests imply mutual evaluation. On the other hand, increasing numbers are thinking in blunt, pragmatic terms. With personal cutbacks, faculty take budget design and fiscal management very seriously with the result that groups such as the American Association of University Professors are beginning to link tenure debates very closely to larger examination of administrative management. Administrators are equally sober in a period of declining enrollment and economic uncertainty. Their language, too, reflects awareness that responsible internal management has become essential. Fram (1973) writes:

> . . . institutions of higher learning may look toward business for help in finding solutions to some of their problems. Terms such as cost-benefit analysis, management by objectives, and systems analysis are now included in the language of college and university administrators. (p. 56)

Thus the conclusion is drawn by some educators that upward evaluation can promote both managerial competence and the internal fabric of mutual understanding requisite to maximal fulfillment of institutional objectives. It is noteworthy that this reasoning is shared by a number of administrators who see internal dissention as a major threat, not simply to peak efficiency, but to institutional survival. Chancellor Ernest L. Boyer (1974) of the State University of New York (SUNY) system identifies formal administrative evaluation by the faculty as a basic factor in creative management, asserting that one requisite to the survival of the American university is a successful effort to "improve accountability to constituencies inside the institution, as well as to those beyond."

A second approach which may lead to the issue of administrative evaluation by faculty is direct interest, either through research or immediate experience, in another form of evaluation, particularly faculty evaluation by students. The reasoning process which moves from faculty to administrative evaluation is expressed by Professor Tyrus Hillway (1973) whose administrative rating scale is currently being tested:

> If teachers can be aided by securing systematically the ratings of their students, it follows logically that administrators also may be helped in improving their work by obtaining ratings from the persons with whom they deal most directly—the academic faculty. Some administrators will deny the usefulness of such ratings, as many teachers oppose, for various reasons, the idea of being evaluated by their students. Since teacher-rating scales have become widely accepted, however, there seems little reason to doubt the eventual acceptance in higher education of rating scales for academic administrators. (pp. 426-427)

The presumption that there exists in the academic structure a precise relationship in which students stand to faculty as faculty to the administration is a point which needs more thorough study. Nevertheless, the fact remains that the analogy has been advanced and is likely to surface in any local setting where discussion of administrative evaluation occurs.

Structuring the Local Study of Administrative Evaluation

As might be expected, these varying motivations which may produce interest in administrative evaluation usually produce distinctive local structures for examination of the issue. When the motivation is closely related to broad institutional self-study programs, faculty participation in administrative evaluation will usually be conceived and structured by those coordinating the institutional study. In this case, the result is often an institutional environment or "climate" questionnaire. Typically the instrument will touch areas which involve the general quality of administrative-faculty relationships, but rarely are administrators identified personally or examined for qualities specifically relevant to their individual roles.

Another type of administrative evaluation occurs as a result of individual requests by the administrator to the faculty members with whom he works. Typically such an evaluation begins with the administrator's design of personal objectives which he later tests by means of faculty and staff perceptions of his performance in the specified target areas. Although more often anonymous, such programs of personal goal evaluation may involve an exchange of signed evaluations and, perhaps, a schedule of follow-up interviews. While administrators using such a program indicate that the practice is helpful to them, they frequently acknowledge that voluntary participation is low. There is a tendency too for such evaluations to be rather generalized and decidedly laudatory. It may be that the lack of anonymity produces inhibitions or, perhaps, that administrators who individually seek formal faculty evaluations are those who already have attained considerable interpersonal support.

In addition to administrative climate studies and individual programs of evaluation, there are increasing efforts to explore the feasibility of university-wide programs in which specified individuals throughout the administrative ranks are regularly and formally evaluated by significant numbers of faculty. The scope of such an evaluation process implies far wider participation in the exploratory phase as well as increased formality during stages of implementation. (It is possible, of course, that a study of the issues by either faculty or administrative officers may precede the opening of formal deliberations involving wide representation.) Ultimately the effectiveness of an ongoing program of administrative evaluation by faculty depends upon the consensus of all groups involved, necessitating the eventual collaboration of administrators and faculty in both theoretical debate and procedural design. A typical process, whether inspired administratively or through faculty interest, begins with a joint resolution of the chief administrative officer and faculty senate, appointing a special task force or *ad hoc* committee to examine the question. Based on the recommendations of the committee and subsequent open debate, the task of designing and implementing the program may be assigned to individual academic units but, more often, to an internal administrative office such as institutional research.

The one exception to this general structure for designing comprehensive programs is the instance where a multicampus state system is committed to a program of administrative evaluation under guidelines established by the legislature or governing board. In almost every case, however, such a system-wide program involves only the chancellor and president of the institution, leaving the question of evaluating other administrators a matter of local option.

Guidelines for Local Study

It is quite clear that local conditions and needs will demand quite varied programs. It is also evident that a generous amount of time must be reserved for debate of theoretical questions related to larger conceptions of the university as a whole, to the theoretical relationships between administration and faculty, and, perhaps, to the ethics of evaluation itself. Nevertheless, it is again stressed that even these matters of "philosophic" import must be considered in terms of practical issues. Who can say that a program of evaluation is either ethical or useful if means cannot be found to protect the rights of both the individual being evaluated and those submitting evaluations? Experience with other types of evaluation tells us that infallible guarantees of individual rights are unlikely and that workable solutions depend more upon reasonable compromise. Consequently, until the specific terms of compromise are established through negotiation and debate, final commitment should be held in abeyance.

Perhaps the most obvious question to arise in a local debate involves the personnel to be included in a program of administrative evaluation. It is probable that most faculty would wish to include the department head, academic dean, and the vice president of academic affairs. Some, but not all, would expect to evaluate the graduate dean as well. It is possible that evening faculty would think first of the director of continuing education. But countless questions remain, with unique variations on a campus-by-campus basis. Certain faculty might comment meaningfully on the performance of the director of computer services; others might need to consult the university directory to ascertain his identity. Similar problems arise concerning the director of research, the librarian, the registrar, and countless others. It may be that local groups will decide to limit their program by excluding all such staff positions (although it is certainly possible to trace important staff-faculty relationships by a painstaking study of the campus structure). Other universities, seeking a more complex program, might consider an expanding structure in which all faculty evaluate the department head, academic dean, and vice president of academic affairs; members of the graduate faculty review the graduate dean as well; members of the faculty senate, or perhaps designated committee members, evaluate the director of research or head librarian. It should be observed, however, that while such an extended program offers a unique opportunity for certain insulated staff people to participate in an exchange of ideas otherwise unavailable, to attempt this sophistication without the requisite planning is certain to encourage meaningless paper work, considerable misinformation, and probable chaos.

The second question likely to be raised is the matter of which qualities or areas of administrative performance can be appropriately evaluated by the faculty. Let us suppose that the program is to include the evaluation of department heads, deans, and the vice president of academic affairs. Using this simplified format, is it reasonable to assume that the same questions are relevant to each administrator or that all faculty are equally competent to answer them? The assumption becomes more difficult to sustain if additional administrators are to be included. Contemplation of this question results in the realization that only compromise can produce a workable plan. For example, if the same set of questions is to be addressed to each administrative position, the questions may become so general in nature as to be empty of genuine meaning. On the other hand, to design a set of questions for each individual administrative role means not only an ominous time commitment but the dubious challenge of arriving at an ideal definition as to what should constitute a "good" department chairman or academic dean. Some study groups, dismayed by such a prospect, have expressed the determination to pattern their evaluation on a program designed in another university in order to avoid the dissension which local efforts to define administrative excellence are likely to produce. A reasonable compromise may be to bypass an attempt to articulate ideal character traits by concentrating instead on performance. Here local groups could rely on pre-existing formal job descriptions or, perhaps, build into the program an initial process of establishing output objectives.

Consideration of evaluation content cannot be considered properly without regard to methodology. It is presumed that faculty evaluation of administrators will be one aspect of a larger pattern of assessment which may include both downward evaluation by the administrator's superior and perhaps peer or self-evaluation. This pattern will directly affect the methods used to obtain faculty evaluations. However, there are several broad patterns upon which variations may be played: in a small institution all evaluation could be conducted orally, one-on-one, although subject to the problems of oral evaluation discussed earlier; another pattern depends on a committee of faculty members, charged with obtaining broad faculty opinion and reporting this information to the administrator; a third, the most common, depends upon a written evaluation instrument, usually an opinionnaire, which may or may not be submitted anonymously. No single method is absolutely satisfactory and, however desirable, it is unrealistic to suppose that complete objectivity can be achieved.

The degree of importance attached to objectivity, to questions of fairness, or to the importance of direct faculty experience with the individual administrator's responsibilities depends upon how the faculty evaluation is to be used. If a perfect analogy between student evaluation of faculty and faculty evaluation of administrators is doubtful, it is nevertheless accurate to presume that on this point—the purpose of evaluation—the terms of debate will be similar. Just as faculty have often expressed belief that students are not in a position to assess the instructor's scholarly competence, the administrator may question a faculty member's qualifications for evaluating the specialized tasks of the administrative position. Similarly, the administrator who perceives his primary task to be the nurturing of the institution as a whole may have little faith that an individual faculty member possesses equally broad concerns. He may, therefore, object strenuously to any plan which implies that his status, salary, or perhaps retention will be determined by the assessment of only portions of his total commitment. It is to be expected that deciding such questions will be both complex and painful. Whether a local program is designed with a primary view toward structuring the administrative employment pattern, producing a standard to govern hiring practices, or creating a program of administrative development, both caution and compromise are in order.

Conclusions

As research in the field of administrative evaluation grows and as increasing numbers of universities implement programs which involve faculty in administrative evaluation, the task of newcomers in the field will become easier. Until sensitive instruments are created and tested sufficiently to predict results, however, there are a number of ways to facilitate local investigations of the issue.

1. Study of the issue of administrative evaluation by faculty should begin early. It is reasonable to assume that the matter will eventually be raised on most campuses and that the presence of individuals with some previous understanding of the inherent complexities will be useful in shaping local investigations.
2. Each theoretical aspect should be weighed in terms of practicality. It is extremely doubtful that every university will or should elect similar programs of administrative evaluation. But premature commitment to any form of evaluation which cannot be effectively performed will lead to delays and complex revision during the planning phase and to poorly conducted administrative evaluation which negates any positive purposes intended.
3. The varying motivations which are likely to lead administrators and faculty to interest in administrative evaluation should be studied carefully. The network of subtle factors which form the "personality" of any given university is very complex. Nevertheless, it is possible to discern certain governing concepts in a discussion of administrative evaluation and, from them, to anticipate some of the components which a successful program must contain to satisfy these conceptual assumptions about the institution and about administrative/faculty relationships.
4. Open debate of the question within the local academic community is necessary. It is unlikely that national activity will ever substitute for thorough and candid discussion among those directly in-

volved in each university. Individuals with some research experience in the subject of administrative evaluation may forward this process by assuring that the necessary questions are raised; they should not expect to dictate the answers.

5. Research and experience in other forms of evaluation may be utilized with due caution. While administrative evaluations by faculty are relatively new in the university, there are comparable programs in industrial and public school settings. There is, in addition, a fairly sophisticated body of literature dealing with the evaluation of university presidents which may be useful. Many suggestive ideas may be drawn from experiences with student evaluation of faculty, particularly in resolving the question of how the evaluations are to be used. But none of these comparable forms should obscure the distinctive roles which administrators and faculty fill in the institution or the uniqueness of the relationship between the two academic components.
6. Thorough pre-planning of administrative evaluation programs, governed by a spirit of compromise, should be encouraged. No one will be served by an approach to this topic which seeks to bathe the complexity and extreme sensitivity in a rosy glow of academic goodwill. There will be, on almost every campus, faculty members with "a score to settle," as well as administrators who "rule by divine right." But there are also faculty who hold deep concerns about the institution and may contribute meaningfully to its management through conscientious participation in administrative evaluation. There are, as well, administrators eager to augment their communication with the faculty and responsive to the idea that faculty can assist them in defining the role they perform. There may be, finally, administrative structures which do genuinely operate most effectively through downward evaluation alone; in some contexts faculty imput through informal channels will be deemed sufficient. A properly conducted program of local study will assist the university in making these choices.

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AN ANALYSIS OF DECISION STRATEGIES EMPLOYED IN THE GOVERNANCE OF HIGHER EDUCATION

Frank A. Schmidtlein, Center for Research and Development in Higher Education

This paper describes some of the characteristics and implications of decision process strategies that are employed in higher education. The term *decision strategy* is intended to denote a particular set of structures, processes, and techniques employed to maintain effective decision-making in an organization. Typically assumptions about decision strategies are more implicit than explicit in the actions taken by administrators. Some of the conditions and values that influence the selection of strategies are presented here in order that they may be made more explicit and serve as a framework for analysis of current decision processes in higher education.

The basic theses set forth in this paper are:

1. Decision strategies employed in higher education rest on a set of assumptions that rarely are examined closely.
2. These assumptions concern the conditions and values found in particular decision environments such as time constraints and preferences for change versus stability.
3. Two conflicting sets of assumptions about the conditions and values in higher education can be identified which have resulted in differing views of what constitutes an appropriate decision strategy.
4. The range of conditions found in higher education does not correspond fully with those assumed by the polar forms of either of these two approaches to decision-making.
5. Therefore, a mixed decision strategy is required that takes into account the need for trade-offs between conflicting values such as the desire for accountability versus the desire for autonomy.

Consequently, the difficult task facing an administrator is how to assess the conditions and values that should be served in particular situations in order to select the decision strategy that is best tailored to his circumstances.

ASSUMPTIONS ABOUT DECISION STRATEGIES

Two assumptions need examination before launching into the description of specific decision strategies. These assumptions have to do with the ability to comprehend and manage events.

Assumption No. 1: The world operates in ways that are theoretically discoverable and, at least in principle, subject to modification through the use of human ingenuity. This assumption underlies the mainstream of Western rationalism and is the basis of modern science. A random or totally unpredictable world, or a world entirely governed by unpredictable metaphysical forces, would relegate decision-making to activities such as rolling dice or conducting the academic equivalent of rain dances. There are, of course, circumstances where perhaps a throw of the dice or a rain dance might have as much effect on outcomes as the analyses we conduct, but this, we presume, is a result of limited human resources, comprehension, or time—not because of a world that fails to follow the laws of cause and effect. If this assumption of causal relationships does not hold, then our attempts to influence the course of our institutions through planning and analysis are futile.

Assumption No. 2: A large number of the factors that influence organizational behavior stem from the situational constraints encountered by individuals and organizations. A common quirk of administrators, particularly as they ascend the hierarchy, is to view the behavior of those beneath them as irrational at best and at worst willful and perverse. There is no denying that some people are willful and perverse but, generally, management actions based on that perception lead to a heavy emphasis on control rather than on changing incentives and constraints. Attempts to change behavior through direct appeals and controls are usually unproductive, as Etzioni (1972) has pointed out. A tendency to design general purpose decision processes and attempt to fit them to all situations and fields in a Procrustean fashion has been a by-product of this focus on individuals' internal motivations. We are all familiar with the unhappy PPBS experience, a recent example of such an attempt at a universal decision system. Decision theorists are coming to recognize that situational factors such as time, resources, and varying levels of uncertainty have great significance for the design of a decision strategy.

We have assumed so far that higher education can be analyzed, the course of events altered, and that the most productive place to begin is by altering incentives and constraints. What then are the most productive strategies that can be employed for this purpose? A description of two competing strategies follows.

INCREMENTAL/REMEDIAL AND COMPREHENSIVE/PRESCRIPTIVE DECISION STRATEGIES

Two decision strategies have been identified by theorists that involve differing approaches to organizational uncertainty. Each approach is described below.

The Incremental/Remedial (I/R) Strategy

This strategy of decision-making has had a variety of names. In the business world it is termed *free enterprise*. Economists term it a *free market system*. Political scientists have called it *a system of checks and balances, incrementalism* or *muddling through*—the latter term usually reserved for someone else's management process. In higher education the I/R concept lies behind words like *autonomy* and *pluralism*.

This view of decision-making has contributed to the notion rooted in our past that "that government governs best that governs least."

It is hard, at first glance, to see the common theme that runs through all of these terms. A fuller description of this decision strategy should provide clarification. Mannheim (1950) describes the elements of the I/R strategy as follows:

> There is no need for planning, no need for being told what is the right way of action, no need for special inculcation of aims or stimulation of motivation so long as there is (a) opportunity for everyone; (b) free choice; (c) scope for experimentation, for trial and error by the individual; (d) available information about the relevant facts; (e) last but not least, free competition, which in connection with the previous factors will create both the incentives and the necessary wisdom to adjustment.

Other dimensions of the strategy are suggested by Braybrooke and Lindbloom (1963):

> It is decision-making through small or incremental moves on particular problems rather than through a comprehensive reform program. It is also endless; it takes the form of an indefinite sequence of policy moves. Moreover, it is exploratory in that the goals of policymaking continue to change as new experience with policy throws new light on what is possible and desirable. In this sense, it is also better described as moving *away* from known social ills rather than as moving *toward* a known and relatively stable goal. In any case, it is policy making that chooses those goals that draw policies forward in the light of what recent policy steps have shown to be probably realizable; the utopian goal, chosen for its attractiveness without thought of its feasibility, is not a heavy influence on this kind of policy making. In the frequence with which past moves are found wanting and new moves debated, it reveals both man's limited capacities to understand and solve complex problems and an unsettled, shifting compromise of conflicting values. (p. 71)

Major characteristics of such a decision strategy include:

1) primary concern for the welfare of the individual,
2) uncertainty reduction through rapid, decentralized adaptation to change,
3) social control maintained by a system of checks and balances, and
4) a major focus on process specifications.

Accountability is maintained in such a process through bargaining arrangements between interest groups. Central policymakers are not held directly accountable for matters settled by negotiation or without recourse to central authority over which they have limited control. The diminished role of central policymakers reduces the organizational distance between those who make significant decisions and those who are affected by them; thus increasing sensitivity to the problems and desires of all parties. Those affected by decisions are less likely to be viewed in detached and abstract terms. Freed from the inevitable uniformity of centrally developed policies, quicker and more responsive accommodations to local circumstances are possible. All of this sounds very good until one examines a different, and for many a more attractive, approach to decision-making.

The Comprehensive/Prescriptive (C/P Strategy)

This method of decision-making also has a variety of titles. Among them are: *comprehensive planning, coordination, management science, rational decision-making,* and, if one is critical, *red tape.* Bowen (1973) lists the major elements of this decision process:

- — a clear statement of goals with an ordering of priorities;
- — allocation of resources toward maximum returns in relation to the goals;
- — cost and benefit analysis including allocation of costs and benefits to particular institutions and to programs within institutions;
- — evaluation of actual results;
- — reporting on the evaluation to governing boards, to sources of financial support—including possibly the general public—and also to faculty and administrative staff.

The rationale for this process is described by Farmer (1972):

- — goals are required to guide the direction of change;
  change is complex;
- — cost/benefit comparisons are required if resources are limited;
- — cause and effect analysis is required if specific end results are desired;
- — an analysis of investment is required if the management of change entails differential risks;
- — a defensible system of decision-making is required if the enterprise entails controversy and accountability.

The principal characteristics of the C/P decision process are suggested by the titles it is given and the attributes listed in the quotations. These are:

1) primary concern for the welfare of the group;
2) uncertainty reduction through analysis, prediction and implementation of logically consistent and comprehensive policies;
3) social control through bureaucratic structures and processes; and
4) a major focus on the identification and measurement of outputs.

As you can see, the C/P process takes a straightforward approach to decision-making. That is, policymakers get program managers to state their objectives and to analyze thoroughly the effects and costs of alternative sets of inputs and processes.

Upon initial examination the *output driven* C/P strategy seems more direct, coherent, and rational than the *process driven* I/R approach. Recently it has gained many adherents among public policymakers. Yet in its polar form it has serious limitations. Let us contrast the limitations of the two strategies.

LIMITATIONS ON THE USEFULNESS OF THE TWO DECISION STRATEGIES

Consequences of the I/R Strategy

One consequence of a decision strategy that minimizes central planning and control has been titled "the tragedy of the commons." Individuals who graze their sheep on a common green have an economic incentive to keep increasing the size of their herds until eventually the green is overgrazed and disaster befalls them all (Hardin, 1968). A number of states currently feel this scenario may well describe the course we are on as a consequence of the graduate program proliferation that has taken place during the past 15 years. Other problems may stem from uncoordinated choice:

1) Program duplication and functional conflicts may occur when there is a lack of central policy and unregulated competition;
2) Program decisions may be made more on the basis of sectional politics and the distribution of political power than on analyses of statewide needs;
3) Competition between institutions or departments may occur in areas where greater benefits would result from cooperation;
4) Local decisions often result in externalities that are difficult to deal with without a central policymaking body with the authority to enforce its decisions;
5) Constituent units of an organization, like individuals, tend to overly discount future benefits—they often would rather have the egg now than the chicken later—so central planning is needed to encourage a longer view of the consequences of actions; and
6) Higher education institutions, as public agencies, are not subject directly to the discipline of the economic market place because they do not receive their income directly from the "sale" of their outputs—their market guidance comes from state policies and student demand.

As illustrated by these problems, the circumstances of higher education do not fit the assumptions of a pure Incremental/Remedial decision strategy. State recognition of these problems has lead to the recent growth of statewide planning and coordination in higher education. A different order of difficulties is confronted in employing the C/P strategy.

Difficulties in the Application of the C/P Strategy

The primary limitations on the use of the C/P strategy relate to the extent of man's knowledge and to constraints on time and resources for research and analysis.

1) The outputs of higher education are difficult to identify and measure;
2) There is no technical method for determining the proper mix of outputs nor their proper distribution;
3) A single activity, such as research, may contribute to both teaching and knowledge production in ways that are hard to disentangle;
4) Theories of learning do not adequately explain the relationship between inputs to the educational process and the consequent outputs;
5) Analysis rests on past experience and the past does not always accurately account for changes that will take place in the future;
6) Decisions often cannot wait for analysis, alternatives do not present themselves concurrrently, and the costs of analysis are hard to weigh against its uncertain benefits.

Before going on to discuss the nature of an appropriate decision strategy, given the shortcomings of both of these approaches, a more detailed comparison of selected aspects of the two will further illustrate their differences.

COMPARISONS OF SELECTED ELEMENTS OF THE I/R AND C/P DECISION PROCESSES

The following figures compare selected assumptions implicit in the two decision process strategies.

In most situations, the assumptions listed in Figures 1 and 2 for each of the two decision strategies are only partly accurate. The problem one faces lies in determining, for a particular set of circumstances, the extent to which each perspective is accurate—at what point does the appropriate trade-off lie between comprehensive analysis, planning and implementation, in contrast to uncoordinated "muddling through." Decision strategies should be selected on the basis of an assessment of just where between these two polar approaches lies the point of trade-off most responsive to a particular set of environmental constraints.

EXAMPLES OF DECISION PROCESS WEAKNESSES

The connection between the rather abstract discussion so far and its practical consequences can best be illuminated by some examples. These examples of decision processes that appear to be insensitive to the problem of trade-offs are drawn from a study of state budget formulation currently underway at the Center for Research and Development in Higher Education at Berkeley. They provide evidence of practices that err by too great an emphasis on the polar assumptions of one or the other of the strategies.

Example 1. The executive and legislative branches of state government are intended to act as checks and balances against one another. In one state separate budget submissions were required for the 1974-75 budget by both the executive and legislative branches. These budget submissions were based on differing philosophies and had differing data requirements. The costs of such a practice to the institutions are very likely higher than the benefits the state gains by the adversarial stance of the two branches of the government.

Example 2. In three states a highly formalized PPB process was planned for the 1974-75 budget cycle. These PPB budget systems were initially being tested concurrently with the existing budget schemes. Budgets were submitted in both formats. The PPB submissions were not utilized to any great extent for decisions as they lacked data relevant to immediate decision requirements. They rested on unrealistic assumptions about measurable objectives, and were rarely supported by data collection systems tailored to their requirements. In addition, the attention to the procedures of PPB resulted in less time for analysis of issues than was the case under the older systems.

Example 3. In almost every state there is considerable unhappiness with the current methods used to develop institutional budget requests. As a consequence in many states budget practices are altered quite frequently. Alterations require changes in data collection practices, retraining participants in the process and the development of new policies and guidelines. All of this is very expensive and time consuming. In many instances the costs of these frequent changes may very well outweigh their benefits. Trade-offs between the benefits of stability as against those of change in such situations seem to receive little explicit attention.

Figure 1

PROCESS ORIENTATIONS OF THE PARADIGMS

ENVIRONMENTAL CONDITIONS	DECISION PROCESS PARADIGMS	
	Comprehensive/Prescriptive	*Incremental/Remedial*
Rate of change	Rapid change intensifies the problem of prediction and thus creates a need to plan.	Rapid change makes analysis complex and unreliable and plans are rapidly outdated so decision-making must be remedial.
Deadlines	The presence of deadlines requires the a *priori* analysis of events and the development of timetables in order to identify and deal with the critical variables.	The need for maintaining options and a flexible bargaining position causes decision-makers to resist committing themselves to courses of action much in advance of deadlines.
Competing priorities	Goals can be ranked and priorities established on the basis of the analysis that precedes policy choices.	Goals are obscure, cannot always be ranked and priorities are established on the basis of negotiation over expressed self-interests.
Repetitiveness	Events are sufficiently repetitive and predictable to make planning feasible.	Events need not be repetitive and predictable for remedial decision-making.
Casual relationships	Relationships are known or are discoverable through analysis.	Relationships need not be known but effects are discovered through response to decisions.
Change technology	Critical variables that must be altered are controllable and a control technology is available.	Change results from incremental remedial adaptation and invention so decision processes do not depend on a *priori* assumptions about the state of change technology.
Outputs	Goals and measureable outputs are essential to assess the accomplishment of objectives.	Means and ends are determined simultaneously through bargaining. Explicit goals and measureable outputs are not essential since decision-making is remedial and incremental.
Quantification	Preciseness of expression and the manipulation of data requires quantification of variables in order to develop effective models of reality that involve complex sets of relationships.	An unsophisticated emphasis on quantification can bias analysis by too great a concentration of attention on variables that more easily can be quantified, or conversely, ignoring important variables that are not easily quantified, and by using numbers in ways that oversimplify and are increasingly divorced from the reality they attempt to represent.
Location of economic and social resources	The analysis involved in planning requires a concentration of resources in specialized analytic units.	Resources for analysis are diffused throughout organizations and centrally located units are likely to be insensitive to the complex values and circumstances throughout the organization that affect the change process.
Location of human resources	Critical decisions are made by central planners and policy-makers so top planning offices have high priority for allocations of human talent.	Critical decisions are made throughout the organization and talent is required wherever decisions are made.
Information resources	Information systems are required to support central planners and policy-makers.	Information is equally necessary at decision points located throughout the organization.
Consensus	Specification of goals, measurement of goal achievement, and analysis of causal relationships will lead to understanding and consensus.	Conflict is fundamental and inevitable and goal clarification only exacerbates this conflict so attention is given to "due process" and "rules of reciprocity" as means for conflict management.
Functions	Functional conflicts, suboptimizations, and dependencies are rationalized and resolved through clear specification of objectives and system views of problems.	Functional conflict, suboptimizing and dependencies are resolved through "exchange" mechanisms in the "market-place."

Figure 2
VALUE ORIENTATIONS OF THE PARADIGMS

VALUE ORIENTATION DILEMMAS	DECISION PROCESS PARADIGMS	
	Comprehensive/Prescriptive	*Incremental/Remedial*
Change/Stability	Rapid adaptation to or control of events is necessary and possible.	Rapid change is costly and has unpredictable consequences.
Certainty/Risk	Risks are reduced through analysis that leads to improved predictive power.	Risks are reduced by incremental change and remedial actions based on the expression of self-interest.
Analysis/Bargaining	Crucial facts are discovered through analysis.	Crucial facts are discovered through bargaining that takes place in response to actions.
Simplification/Complexity	Complexity is discovered and organized in ways that give it meaning through formal analysis.	Complexity is discovered by each individual reacting to his particular self-interests and adjusting to the constraints imposed by his physical environment and the interests of others.
Clarity/Ambiguity	Clarity improves the quality of decision-making.	Ambiguity aids consensus and maintains bargaining positions.
Expertise/Legitimacy	Expertise is the critical requirement for effective decision-making.	Legitimacy is the critical requirement for effective decision-making.
Consistency/Diversity	Consistent goals and strategies are necessary to achieve given ends.	Diversity avoids compounding errors when goals and strategies are uncertain.
Control/Freedom	Consistent policies require the exercise of management control.	Mutual bargaining permits individual discretion and avoids incapacitating conflict through interaction and compromise.
Accountability/Autonomy	Responsiveness to the collective interest requires accountability to the central policy-makers who are the representatives of the public.	Responsiveness to the collective interest requires freedom to bargain at many levels with a multitude of conflicting interests.
Collective Interest/Individual Interest	Serving the collective interest is a paramount concern.	Reconciling individual interests is a paramount concern.
Prediction/Remediation	Decisions involve large sunk costs and mistakes are costly so analysis and prediction are crucial.	Analysis and prediction are expensive and uncertain so corrections are made through decentralized operational decisions.
Optimum/Satisfactory	Values can be analyzed and can be ordered so that optimum decisions are possible.	Values are discovered from responses to situations, and cannot be ordered so, therefore, optimum solutions cannot be defined accurately in advance.
Cooperation/Competition	Cooperation between individuals with well-defined roles leads to efficiency.	Competition in an environment characterized by unfettered bargaining over perceived self-interests leads to efficiency.
Principles/Compromise	Values can be discovered and ranked so, therefore, principles can be defended on the basis of evidences.	Values are obscure and are determined by bargaining and compromise so, therefore, principles are elusive and are in conflict.
Quality/Equality	Equality is maintained by the controls employed to implement plans and quality is maintained by the broad application of consistent evaluative criteria and sanctions.	Quality is maintained by the competitive features of the market-place and inequality is minimized by the rules established for formal decision processes.

Figures 1 and 2 are reproduced from the following article with permission from the *Educational Researcher*: Schmidtlein, F.A. "Decision Process Paradigms in Education." *Educational Researcher*, Vol. 3, No. 5, May 1974, pp. 4-11. The article in *Educational Researcher* treats decision strategy in somewhat greater depth than does this paper.

Numerous additional examples can be listed, but given limited space, some generalizations are in order.

A CURRENT PERSPECTIVE ON DECISION STRATEGIES

In higher education today the dominant orientation of many policy makers, particularly at the state and federal policy levels, is toward the C/P strategy. However, the conditions set by the environment in which higher education takes place and the traditional values associated with higher education are more nearly compatible with the use of the I/R STRATEGY. Consequently, despite the belief in the efficiency of the C/P strategy and the use of planning rhetoric, a high proportion of decisions in higher education continue to be made on a disjointed, incremental, remedial basis. Anyone dealing with a faculty knows the traditional, bureaucratic model of top down decision-making does not describe an institution of higher education. A gap, thus, is visible between a C/P ideology and I/R practices in higher education. The attempt to close this gap has resulted in an increase in evaluation, auditing, centralization of decision-making and increased attention to accountability. This response to the gap between expectations and performance of the C/P decision processes will fail and create disillusionment because it does not deal with the basic constraints that affect the success of decision processes. In fact, a focus on the willful behavior of people, which is the common result of auditing and attempts to strengthen accountability, is probably particularly ineffective since it ignores situational constraints and fails to recognize that people's values and ideologies are highly resistant to change. A number of people are now questioning the broader assumptions that lie behind contemporary concepts of efficiency, accountability and comprehensive planning. A new approach to policy formulation is needed in higher education which takes into consideration the constraints affecting the legitimacy and effectiveness of decision strategies and which is sensitive to inevitable value trade-offs.

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A DECENTRALIZED APPROACH TO THE MANAGEMENT OF A COMPLEX RESEARCH UNIVERSITY

Lattie F. Coor,
Washington University

The locus of authority in the contemporary college and university seems to hold unlimited fascination for observers of higher education. Everyone from the students to the State Board of Control and the Governor seems to be searching for the source of institutional power, and all express varying forms of exasperation at the futility of their pursuit. One thing most observers seem able to agree upon: whatever the locus of power used to be—autocratic president, domineering Board of Trustees, overpowering senior faculty oligarchy or whatever—it has changed, with dispersion of authority the hallmark of the new mode, making it ever harder to locate and analyze power and decision-making as it has become diffused throughout the system. "The receding locus of power" Noble and Pym (1970) call it; "horizontal systems with collective leadership, . . . interlaced webs of tension in which control is loose, power diffused, and centers of decision plural" is the way Cleveland (1972) describes it for contemporary complex organizations in general in his insightful essay, *The Future Executive.*

Simultaneously with the pursuit of "who's in charge," there has been an increasing cry for accountability on the campus. The call for accountability and the tendency toward increasing dispersion of institutional decision-making have within them the seeds of a classic conflict. A dispersed authority structure suggests decentralization and fragmentation of the decision process, atomization into individual units that neither lend themselves well to orderly control nor tidy analysis. Accountability, on the other hand, appears on the face of it to require uniformity in the language, concept, and style of the decision process so that wholes can be disaggregated to functional levels for analysis, with uniformity in basic data elements and program structure so they can be re-aggregated and analyzed with respect to an objective-oriented outcome structure. As well, a strong propensity for inter-institutional comparisons exists, further suggesting the need for campus-wide definitions and analyses.

Conceptually, accountability and a decentralized decision process need not be antagonistic. In the current state of the art they seem functionally to be so.

This paper examines the nature of the decentralized decision process in the complex research university, and discusses ways in which such an institution can at once be decentralized and accountable. There is a tendency for the proponents of systems-oriented management techniques to equate accountability with centralization of decision-making. This paper, drawing on the specific case of Washington University, argues that such techniques as program planning and evaluation can function effectively in a decentralized setting.

The key, of course, is matching management technique to the nature and needs of the institution. It is no more appropriate to try to impose the decentralized management techniques appropriate for a complex research institution on a single-purpose institution than it is to assume that a management system designed for a wholly undergraduate institution will work for the complex research institution. Tailoring the management system to the institution is as important as tailoring the education program to the specific needs and capacities of the students being served by the institution. What works well for one institution may be quite inappropriate for another.

There are good reasons why complex research universities are so decentralized. In its simplest terms, the research university is decentralized because there are so many different divisions or schools of the university doing so many different things. My institution educates undergraduates in the arts and letters, in accounting and engineering, in sculpture and physical therapy; it trains graduate and professional students in history, theoretical physics, law, painting, medicine, finance, clinical psychology, urban design, and orthodontics. And it conducts research, $45 million worth a year that is supported and a lot more that is not. It gives lectures, concerts, short courses, conferences, and consultations for the community, state, local, and national. Everything we do fits one way or another the program classification structure of the National Center for Higher Education Management Systems (NCHEMS at WICHE). Everything we do can be identified, attributed, and crossed-over from whatever system we use to a cost per credit hour and compared with everything else we do and everything else every other institution does.

But to analyze our institution that way, using the techniques available to date, leaves a great deal to be desired. Because the state of the art at NCHEMS does not adequately recognize the fact that many of our costs are inextricably mixed, with jointness of costs between undergraduate and graduate education and research, and because the state of the art does not satisfactorily account for differences in mission, quality, and outcomes of these various distinct entities within an institution like ours, distortion in analysis, and hence in judgment, is inevitable.

Of greater importance than distortion in analysis, however, is the tendency to use such analytical techniques for aggregative and hence centralizing purposes. Centralization of analysis and decision-making is not inherent in the use of these techniques, but it often accompanies their use, either because those advocating and/or employing such techniques seek greater centralization of policy information and implementation, with these techniques being a helpful handmaiden to that end, or because the tendency to aggregate and centralize is irresistible in the face of information that enables one to do so.

At Washington University, we believe a more effective approach is to decentralize academic program and fiscal management, lodging those responsibilities at the level of the school deans, designing the system in such a way that they have incentives to perform efficiently and effectively.

DECENTRALIZED APPROACH

The premises on which the decentralized/incentive approach rest at my institution are these:

1. The appropriations model has significant limitations for the private institution. Those responsible for spending income must also bear responsibility for generating it.
2. Responsibility for income and expenditure and responsibility for program development, evaluation, and control should rest, to the extent possible, in the same hands. For my institution, this means responsibility for both resides substantially in the individual schools, and, within the schools, in the hands of the dean.
3. Central institution-wide planning and management for the University is essential, but, to be successful, it must be developed as part of an active interplay with the primary constituent units within the institution. Management information systems are important in providing the central administration the capacity to set and evaluate overall institution policy and to maintain control over the execution of that policy, but a prime benefit of such management information systems must also be their capacity to provide discrete and relevant data as required by each of the constituent units for its own management purposes.
4. A successful management system recognizes the dynamics of fiscal incentives in motivating human behavior in an organizational setting and uses fiscal incentives to maximize accomplishment of goals within that setting.
5. Complex research institutions derive income from a variety of sources, including direct support for research and graduate training. The management system must recognize the diverse nature of support for each of the institution's units and provide incentives for each of the units to maximize return from as many of those sources as possible.

We call our scheme the reserve school system because each school is set up as a financially self-sufficient unit, responsible for making its income match its expenditure. To protect against unforeseen deficits, the school is expected to develop a nest egg, or a reserve, against which it can draw temporarily until it can bring its income and expenditures back into balance; thus the name, the reserve school system.

The idea of reserve schools is not novel. The Harvard concept of "every tub on its own bottom" has been around for a long time. Nor are we alone in encouraging each school to take greater responsibility for managing its own affairs. The "responsibility center" system launched two years ago at the University of Pennsylvania and the "management center" concept of Case Western Reserve University seem to rest on similar premises. Each system, however, appears to have its own characteristics, tailored to the specific needs of the institution.

Several things impelled our adoption of the reserve system. For one thing it had been in effect for many years in the schools of law, medicine, and social work, three of our ten schools. The rest of our schools have not, until recently, been on such a basis. Rather, they have functioned in the more typical manner of most schools, with appropriations being allocated annually from the central budget.

During the boom years of the early 1960s budgets in all of our schools were growing so rapidly that there appeared to be no functional difference between the performance of the reserve schools and the non-reserve schools. As fiscal stress began to occur in the early 1970s, however, we discovered clear differences in the annual results of the reserve and non-reserve schools. The non-reserve schools, those in the central fiscal unit, began showing substantial annual deficits as depicted in Table 1.

At the same time we were experiencing growing deficits in the central fiscal unit, the opposite was occurring in the reserve schools. The Law School, which had been running deficits in the mid-1960s had begun to function in the black by 1971 (see Table 2), and Social Work moved out of a deficit position in 1970 (see Table 3). Medicine, long a strong fiscal performer, continued to perform well during this period.

Table 1

WASHINGTON UNIVERSITY

Central Fiscal Unit,

(Including Engineering)

(In Millions)

Fiscal Year	Total Expenditure	Annual Deficit	Accumulated Deficits
1969	34.9	.0	2.9
1970	36.3	.0	2.9
1971	37.6	1.5	4.4
1972	37.6	1.9	3.3*
1973	38.1	1.0	4.3

*1.1 million reduction in the deficit due to a sale of stock given for operating funds.

Table 2

WASHINGTON UNIVERSITY

School of Law

(In Thousands)

Fiscal Year	Total Expenditure	Annual Results	Reserve
1969	$ 675	$ −47	$ 6
1970	852	+14	20
1971	917	+60	80
1972	1,277	+42	122
1973	1,480	+106	228

Table 3

WASHINGTON UNIVERSITY

School of Social Work

(In Thousands)

Fiscal Year	Total Expenditures	Annual Results	Reserve
1969	$1,135	$−19	$ 31
1970	1,153	47	78
1971	1,167	51	129
1972	1,276	134	263
1973	1,371	12	275

Several factors seemed relevant in analyzing the differential performance between the reserve schools and the non-reserve schools. Professional education was attracting growing numbers of students beginning in the late 1960s and early 1970s, so income from student tuition was solid. That certainly was a factor in Law and Social Work where income from tuition in 1973 accounted for 84% and 44% respectively of their total budgets; it was less influential in Medicine where tuition accounts for only 4% of the school's total annual expenditure.

As well, support for research and training were influential contributors to 2 of these schools, Social Work and Medicine, with 33% and 65% of their respective budgets coming from grants and contracts in FY 1973.

But the overriding factor in the positive results of these schools, we felt, was the fact that the school was responsible for its income as well as its expenditures; the school operated under the mandate to break-even or pay the consequences. As well, the schools had an incentive not only to avoid deficits, but, more positively, to perform well so that excess income generated could serve as venture capital for new or expanded activities.

The most influential conclusion we came to in examining the performance of the reserve schools was the judgment that the appropriations process, however well it worked in a time of expansion and bountiful resources, was not well suited for periods of slow-down or retrenchment. As income began to soften, expenditures continued to soar with those responsible for expenditures showing little regard for the shifting income base. Thus, we found we had the worst of two worlds. The schools controlled the program, and, with that, a large part of the capacity to generate income. The central administration, on the other hand, was responsible in the traditional appropriations paradigm for providing the funds necessary for the programs. Admonition, constraint, and care in allocating revenue could only go part way, we found, in maintaining a balance between income and expenditure.

If funds are being provided regularly from outside the institution, as in the case of a legislature for a public institution, the system of internal appropriations model can work. If making the strongest possible case for needing more money to an outside agency can in fact succeed in getting that money, then responsibility for generating as well as spending need not rest in the same hands. But that is not the case in a private university. Either additional income must be generated by a variety of techniques internal to the institution, appropriations reduced, or a deficit will result. It was our conclusion that the best way to avoid the deficit was to put responsibility for income and expenditure in the same hands. For us that meant the deans, and in the late 1960s, we set about putting more of them on a reserve basis.

We started with the School of Dental Medicine in 1969. The school, in 1967, was running a deficit of $200,000 on a total expenditure of about $1 million. While the applicant pool for the school was strong, about 10 applicants for each available space, the school was in antiquated quarters that made contemporary teaching methods and an active research program difficult. The University administration and the Board of Trustees concluded the situation at the School of Dental Medicine should not continue over the long run, and, after careful planning, the school was set on a course to reserve status in 1969. Table 4 shows the results.

Table 4

WASHINGTON UNIVERSITY

School of Dental Medicine

(In Thousands)

Fiscal Year	Total Expenditures	Annual Results	Reserve	Total Value of Grants & Contracts
1965	.9 million	−138		
1966	1.1 million	−197		
1967	1.1 million	−204		
1968	1.2 million	−101		
1969*	1.4 million	6	104	444
1970	1.9 million	+120	224	999
1971	2.3 million	+157	381	1,282
1972	2.1 million	+149	530	1,077
1973	2.2 million	− 6	524	908

*Reserve Status Introduced

During the period of this conversion to reserve status, the federal capitation program, plus funds for capital improvement, which totalled $2 million for the period, were very influential in the success of the conversion to reserve status. Indeed, it is doubtful if the fiscal and educational development of the school could have succeeded without that help. Each school, however, has differing ways in which it can generate additional income if there is incentive to do so, a principle that has played an important role in our decision to adapt some form of incentive/reserve system for each of our schools. For Dentistry it simply happened to be federal incentive money for facility improvement and for enrollment expansion.

There is evidence that the incentives have prompted development in the school beyond the more evident inducement of the capitation and facilities money. The school now generates substantially more income from its student fees, for example, as a result of its decision to go on a year-round basis, thus enabling it to handle substantially more students in the same facilities in each 12 month period. Since 1973, the year the 12 month operation was introduced, the yearly enrollment has increased and income from tuition has increased from $622,000 in FY 1973 to $957,000 in FY 1975. It is our belief that the incentive to generate new income was instrumental in inducing the school to adopt these more cost effective measures.

Our School of Engineering and Applied Science, the other of our schools on its way to reserve status, offers another good example of the success of our concept of the decentralized/incentive approach. The School of Engineering in 1970 was running a deficit of $790,000 on a total expenditure of

Table 5

WASHINGTON UNIVERSITY

School of Engineering and Applied Science

(In Thousands)

Fiscal Year	Total Expenditures	Annual Operating Results	Reserve	Grants & Contracts
1970	4,788	−790	−27	2,130
1971	5,120	−950	19	2,094
1972	5,094	−898	17	2,048
1973	5,514	−271	130	2,079
1974	5,475	−285	108	1,761
1975	5,642	−108	83	2,000
1976*		−100		
1977*		0.0		

*Estimate

$4.[illegible] million. We placed the school on an 8-year plan to achieve reserve status in 1973, and, as Table 5 shows, it is now expected to achieve break-even with some reserve by FY 1977, 4 years ahead of the planned date for reserve status. Except for adverse performance of its endowment in FY 1975, the result of a large share having been placed in a total return concept capital pool, the school might have made reserve status next year.

There is no single reason for the improved performance of the school. Rather, careful planning and management by the dean has resulted in the convergence of several factors to accomplish these favorable results. Careful recruiting has built the undergraduate student body from an FTE of 475 in the spring of 1970 to 650 expected in the fall of 1975 with a significant increase in the quality of entering students. Similarly, by careful planning and pruning, the faculty size has been reduced from a full-time faculty of 79 in 1971-72 to 61 in 1973-74. Importantly, sponsored research has been maintained at a high level.

Because the dean had the responsibility for income as well as expenditures, and had the incentive to perform more effectively so as to fund growth and development for the school, we have a much better school educationally as well as fiscally.

This same belief has set us about planning ways to bring our four other schools (Arts and Sciences, Architecture, Fine Arts and Business) onto a reserve, or at least a modified reserve plan. (The tenth of our schools, the School of Continuing Education, has historically functioned in the black, on a type of reserve basis, and we are endeavoring to keep it that way.)

In the meantime, we have introduced an incentive scheme for non-reserve schools that encourages them to improve their income-expenditure relationship as a way of generating some additional income for venture capital within each school. For the most part, this modified reserve plan currently in use for these four schools enables them to carry forward unspent funds if they have met their income and gift targets for the year. In addition a research reserve has been set up to enable them to share in research income generated. It is our plan to move these schools onto a reserve basis as feasible.

At the heart of our decentralized/incentive plan is the belief that the best decisions, educationally and fiscally, can be made at the school level. We do plan at the institution-wide level, and individual schools are required to conform to a set of institution-wide policies and procedures, such as tuition rate, locus of basic discipline instruction, and salary schedules. Individual schools do not function in a policy vacuum. Their policies, procedures, and key decisions are worked out in close cooperation with the central administration. All in all, our experience to date confirms our view that decentralizing responsibility offers the greatest opportunity for successful performance.

Advantages and Disadvantages

The advantages of our system are several. They can best be summarized by a rephrasing of the premises on which the concept rests. The most salient advantages are:

1. The system recognizes the fact that those who are responsible for program decisions should be responsible for the financial consequences that accompany those decisions.

2. It recognizes the dynamics of fiscal incentives in motivating human behavior in an organizational setting and uses fiscal incentives as the basis for fiscal accountability.

3. It recognizes the pluralistic nature of a complex research university.

4. It recognizes the diverse nature of financial support for the complex research university and provides incentives for academic units to maximize return from as many of those diverse sources as possible. In an interesting way, it makes the schools more responsive to student need and demand.

5. It permits the development and maintenance of central control over institution-wide characteristics. It permits movement along a centralized/decentralized continuum depending on program and/or the circumstances of the moment; it provides a diversity of decision strategies as circumstances within the university requires.

6. It does enable us to plan and use productive new management techniques but to do so at the operational level, and to use the analytical techniques for unit-by-unit planning and management without converting our entire reward system to an arbitrary formula of dollars per credit hour on an institution-wide basis. We can be selective with management techniques, using them as individual program levels require, and as the state of the art permits. It does permit analysis at the institution-wide level, but does not place the whole burden of analysis there.

Obviously, as with any system, there are disadvantages. Among the more salient are:

1. The rich and the poor sometimes are forced to live side-by-side, and if the central administrative finances are not sufficient to tide over a worthy unit through lean times until its circumstances improve, relations can be strained. In my judgment, this is the most significant potential problem of this approach.

2. Without a strong central administration and good working relations between the central administration and the deans, the following could develop:

   a. A divergence in policy, especially with respect to quality, among schools, with the possibility of competition between schools for students and funds.

   b. The system could lead to unhealthy fragmentation within the institution.

   c. The system could prompt schools to set up their own educational subsets, because of cost and staffing advantages, leading to greater overall costs and to a weakening of overall educational strength of the University.

Every approach has its disadvantages as well as its advantages. We at Washington University obviously believe on balance the advantages of this approach considerably outdistance the disadvantages. A key to the success of the decentralized system I have described is the quality and ability of the deans and the relationship between the deans and the central administration.

The role of the dean is absolutely crucial. It can be compared, in many ways, to that of the president of a college. With an excellent and wise dean, the school can flourish; with one who's mediocre, the school will not do well.

It is important to point out, in conclusion, that our system does not embrace "the market place" as defined in classic terms, nor is it institutional anarchy. There is central direction for the institution. The front office does set basic institutional priorities and play a significant role in developing and implementing central plans for the institution. The tubs on their own bottom neither float aimlessly, nor totally independently. We do maintain institutional standards. There is active and productive collaboration among schools. We do chart our basic course and analyze our results. We are accountable.

But we do recognize diversity, reward ingenuity and entrepreneurship, insist that those who spend also earn, give incentives for good performance and rewards for those who accomplish it. Ours is an approach that requires subtlety in definition and in operation, tolerance for uncertainty and ambiguity, greater confidence in the capacity of the deans to perform, and greater willingness to give them room to do so and to pull them up short when they do not.

Ultimately the value of the approach we use is that it conforms to the way in which our institution is designed, and the way in which it is likely to function well. In choosing the right management system for an institution, there is something to be said for that.

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MANAGERIAL STYLES AND DECISION-MAKING IN HIGHER EDUCATION

Warren W. Gulko,
Pauline F. Lukens,
University of Massachusetts

Higher education, as we are all painfully aware, is undergoing significant and rapid change. From the post-war boom of the 40s and 50s through the student disruptions of the 60s, we now find ourselves in the mid-70s, entering a period of severe fiscal crisis. Diminishing resources for higher education will impact colleges and universities in a variety of ways. One of the ways will be to modify radically management styles and decision-making in higher education.

Frank Schmidtlein has outlined two contrasting paradigms for decision-making in higher education. The Incremental/Remedial approach which reflects the autonomy and pluralistic nature of higher education and takes into account the collegial model of colleges and universities and the Comprehensive/Prescriptive paradigm which reflects the coordinative and analytic approach. Lattie Coors has described a modified Incremental/Remedial paradigm which focuses on the Incentive/Decentralized concept of institutional management—particularly as characterized at Washington University.

In our view, however, the problem of decision-making in higher education needs to be addressed not from the historical perspective of what has been, nor from the current perspective of what is, but more importantly, from the future perspective of what will be. In the past, resources were available to accommodate the errors of faulty planning. The many Carnegie studies published over the past few years warn us that no longer will there be the insulation that protects higher education from the impact of unrealistic assumptions.

The Distinction Between Management and Administration

Because of the rapidly changing environment in higher education, colleges and universities must adopt a new management perspective in governing their operations. For a variety of reasons, however, college and universities have restricted innovative approaches to management. It has been our experience that, indeed, to many the term "management" borders on obscenity! And yet, to many of these same people, the term "administration" is acceptable—indeed, palatable. Academia, in clinging to its collegial model of operation, seems unwilling to recognize the need for management.

But what is management in higher education? Richman and Farmer (1974) describe the distinction between management and administration:

> Some functions are performed by both managers and administrators, in different ways. Management involves strategy, innovation, initiating and bringing about change, creative problem-solving and decision-making, actively seeking out alternatives and opportunities, reformulating goals and priorities, redeploying resources, negotiating, resolving conflicts, dynamic or active leadership, diplomacy, statesmanship, and a high degree of risk-taking and entrepreneurship. (pp. 14-15)

These characteristics of management are clearly desirable attributes in the coming period of diminishing resources, an era for higher education which will require innovation and perhaps radical change if many of our institutions are to survive. What then is administration? Richman and Farmer continue:

> Administration implies more routine decision-making and operations, and the implementation of goals, priorities, and strategies, usually determined by others. It is more concerned with following predetermined policies, procedures, and regulations. It tends to be much more adaptive, passive, and reactive than management, and it is much more of a closed system concept primarily concerned with internal efficiency and operations. It is also more concerned with internal monitoring and control than with external environment change and strategic planning. To us, at least, administration implies bureaucracy. That is not to say that it is not important. It is, and effective management needs the support of competent administration and administrators. However, in the turbulent environment in which most academic institutions now find themselves, effective and professional management is more critical than competent administration. (pp. 14-15)

The characteristics of administration as described by Richman and Farmer are appropriate it seems for a status quo approach to maintaining the enterprise. The distinction then is that mangers decide—administrators implement. And in the changing environment of higher education, we believe management will play an ever-increasing role. Indeed, for many institutions, survival may depend on the institution's willingness to adopt, if not embrace, a philosophy of rational management.

Resistance to Management

Management, however, is a notion alien to many in higher education. Balderston (1974) describes this alienation succinctly: " . . . new approaches to management are very much needed and are on the way, yet management is counter to the university tradition. To some of the important audiences it is a term conveying insult and provocation" (p. 2).

The attitude toward management, on the part of some faculty, indeed on the part of some administrators, causes unnecessary resistance to the adoption of management principles. For many academics, there is confusion between management of the institution and managing individual faculty. These are distinctly different concepts. Translating the concept of a rational management perspective into the concept of managing the individual faculty is, of course, a false argument. But it is an understandable conclusion when one considers that many institutions are currently operating in a mode akin to McGregor's (1960) Theory X, what Peter Drucker (1974) calls the paternalistic approach to management. For higher education, Drucker's paternalistic management may be regarded as *in loco parentis* management—where individuals responsible for institutional decision-making have adopted a basic philosophy that faculty and department heads are immature, unreliable, unethical; and thus cannot be trusted to make rational decisions. One of the interesting manifestations of the paternalistic approach to management is that most individuals who are operating under the *in loco parentis* mode of management ironically resist similar management philosophies applied to them. In short, they expect autonomy from above and seek obedience from below. For these reasons resistance to the adoption of a rational management perspective stems not only from the faculty but also from many of the people who currently occupy management positions in today's colleges and universities.

New Areas of Management Concern

As we have said, higher education is in a state of transition. For one thing, higher education in American society seems to have reached a plateau. Glenny's (1975) keynote address affirms this plateau and forecasts decline. In the years ahead, most institutions, in order to survive, will have to concentrate more of their efforts in areas that have not been sufficiently addressed in the past. For example:

1. Colleges and universities will have to justify their existence and demonstrate their worthiness to various constituents of the institution, both internal and external.
2. For many institutions, both public and private, extensive efforts will be necessary in order to maintain levels of student demand.
3. Virtually all institutions will have to be increasingly innovative and imaginative in deploying scarce resources effectively.

Justifying an institution's existence and demonstrating its worthiness requires political skills and improved information. Political skills are necessary to know how to most effectively accomplish the task of reaching the institution's constituents and to tell the story in terms that are effective and understood by the constituents. Improved information will be necessary in order to have the basic facts which support the story.

In order to maintain student demand, it is necessary to employ general marketing skills in the broadest sense of that term. To maintain student demand may require major modifications of the institution's programs as advanced technology and improved communications result in more rapid shifts in societal preferences. Responding to these shifts will require effective program planning. Better information will be essential.

Imaginative and innovative deployment of scarce resources requires basic resource management skills. Simply stated, good management practice will result in more effective resource use and higher productivity. Again, information will be the key!

The Need For Rational Management

Some institutions have been facing these problems for many years. For other institutions, these areas are of immediate concern. If these problems are present today, why isn't it evident that institutions are making significant inroads to justifying their existence, to maintaining their student demand, to deploying their resources effectively? John Keller has referred to higher education as "a resource consuming, output producing enterprise, capable of being managed in the conventional sense." And yet, such management is not evident. Why? The answer, we suggest, is that higher education has not accepted the notion of rational management. In many cases, the executives of the institutions, the people who occupy the management positions, are not managers. Consider for the moment your own institution. For example, how many of your deans have been appointed to their position of academic leadership based on their management capabilities? How many senior executives in higher education do you know who have been trained or selected because of their management expertise? In your judgment, what proportion of higher education's executives have demonstrated management skills?

To prepare for the future, we must train a new breed of college and university managers. Men and women who are skilled in leadership and decision-making, who are sensitive to the purposes of higher education in our society, and who understand the nature of the academic process. These new managers of higher education will require an expanded role for institutional research.

The Challenge to Institutional Research

The function of management, we have said, is leadership and decision-making. Effective, rational management in higher education requires both better managers and better information. As Balderston (1974) wrote: "Just as decision-making is the core function of management, informed and rational decision-making is the core of effective management" (p. 99).

The challenge to institutional research will be to facilitate effective management by providing information in a timely manner. Bear in mind, however, that information is not restricted to quantifiable data. Indeed, the good analyst brings to bear on a problem all aspects of information that will facilitate rational decision-making. New technologies, coupled with increasing demands for data will soon bring most institutions up to a reasonable level of data capabilities. Data is no longer the issue—information is! In order to prepare for the management styles and decision-making requirements of future higher education, institutional researchers must now turn their attention to the subjective aspects of information. We must begin to develop good policy analysis capabilities and develop within our profession the necessary skills and capabilities to supplement quantitative information with qualitative judgments on the policy implications of humanistic, environmental, and societal aspects of institutional problems. The changing management styles and decision-making roles in higher education offer to institutional research a new challenge. That challenge is information. Information in its broadest terms. It is now our responsibility, as practitioners in the field, to meet this challenge.

MANAGERIAL STYLES

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THE PROGRAM BUDGETING EXPERIENCE IN WISCONSIN

Elwin F. Cammack,
University of Wisconsin System

My purpose in this discussion is not to present a theoretical treatise on PPBS, but rather to share with you some of the experiences of the University of Wisconsin System in relating to the requirements of state government placed upon state agencies for presenting budgets to the legislature. Within this context it is well to remember that the State of Wisconsin has taken pride in the fact that it has been in the forefront in the implementation of program budgeting procedures.

The laws of the State of Wisconsin assign the responsibility for objective setting and performance evaluation to the State Department of Administration. The statutes read:

> that (1) all departments other than the legislature and the courts prior to each budget period on the date and in the form and content prescribed by the department shall prepare and forward to the Department of Administration the following program and financial information, (a) a clear statement of purpose of each budgetary unit, (b) clear statements of specific objectives to be accomplished by specific dates, (c) proposed plans to implement the objectives and the estimated resources needed to carry out the proposed plans, (d) a statement of legislation required to implement proposed program and financial plans, (e) a clear statement of the methods of evaluation of results of the program services including the information necessary for evaluation purposes.[1]

In response to the statutory requirement that state agencies present budgets in a programmatic format, the Department of Administration instructions on budget preparation state:

> Objectives are defined as the stated purpose of an organization toward which its services are directed. Identifying meaningful objectives is a fundamental step in the program budgeting process, therefore, a clear statement of objectives should logically precede each determination of a specific course of action. Objectives relate to achievement and not means and therefore are output oriented rather than input oriented. They provide the basis for relating the activities of the agency to executive and legislative intent as well as the basis for performance evaluation.[2]

The statutory requirement and Department of Administration interpretation of this requirement have meant that the University of Wisconsin System was required to develop a process by which its budget request to the legislature could be presented in a modified program budget format.

The first step in this process was relatively easy. For several years the University has had an activity code as part of the accounting and budgeting processes; hence, it was relatively simple to present the budget request in terms of the primary programs of instruction, research, and public service, as well as supporting programs of general operations and services, physical plant, academic support, and some other specific accounting/program requirements. Much more difficult and challenging to the University System was the requirement that specific program objectives be established in such a way that the achievement of these objectives could be evaluated by agencies of state government. We were immediately faced with the dilemmas that face all of higher education. Specifically, our dilemmas were, (a) what are the "outputs of the higher educational enterprise," (b) how can these outputs be quantified, and (c) by what criteria can the achievement of the stated objective or output be measured. The answer to these questions becomes even more difficult in an environment in which it is expected that budgetary contracts be made as part of a biennial budget process with the implication that the evaluation of performance can be accomplished at the end of one or two years. Thus, we not only had the problem of attempting to identify the outputs and criteria by which they could be measured but a severe limitation of timing since it should come as no surprise that many of the "objectives of the higher educational enterprise" are achieved over an extended time period and not within one or two years.

Notwithstanding these difficulties the University System has made a concerted and, I believe, somewhat successful effort to comply with the requirements of state government for a programmatic approach to the budgeting process. I would hasten to add that the initiative in this effort has not been entirely with state government. As I have mentioned earlier, we had earlier built within the accounting and budgeting systems the ability to identify activities such as instruction, research, public service, and the supporting activities.

Let me try to summarize in a much oversimplified way the approach the University of Wisconsin System has taken to this problem. First, it was determined that to attempt a "zero base budget approach" was an unrealistic approach to exploring and testing some of the concepts to be used. Thus, it was decided that we would begin with an attempt to develop the incremental part of our budget request in such a way that specific objectives could be identified and "quantified" in such a way that an evaluation of performance could be made possible. The technique used was what we chose to call a decision item narrative format. This format consists of three general components: first, a brief title description of the proposal along with an identification of the program/subprogram in which the request falls; second, a summary of the budget requirements, a necessary step in identifying the budget request; and, third, a statement of intended accomplishments and justifications. It is in step three that we have attempted to identify the information necessary to meet the statutory program budgeting format. This section includes: (a) a statement of proposed goals, i.e., what general accomplishment is intended and how does it relate to the mission, to the institution or unit; and (b) specific objectives, that is, what specific objectives, that is, what specific accomplishment, benefits or service outputs are proposed. The statement of specific objectives are to include criteria by which the results of progress of proposed projects will be evaluated. This implies that the statement of objectives must establish the *primary criteria* for evaluation. These criteria should cover the essential considerations of effectiveness, extensiveness, efficiency, and an added dimension, time.

I would not leave you with the impression that we have discovered either ways to identify in quantitative terms the objectives of the educational enterprise or to evaluate both quantitatively and qualitatively the achievement of these objectives. Rather, we have attempted to approach the problem in a limited and somewhat exploratory environment recognizing full well the constraints under which we are working. I believe we have, however, been able to focus our thinking on the relationship of proposed new programs included in the budget request to broad missions and rather specific program objectives of the various campuses within the University of Wisconsin System and that our budget development has a defensible and consistent overriding rationale. We are continuing in our attempt to improve the process, recognizing full well that major questions remain as to whether or not, in fact, PPBS is either appropriate or desirable in the educational enterprise.

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[1] *Manual on budget preparation.* Madison: Bureau of Planning and Budget, Department of Administration, 1972, p. 5.

[2] Ibid., p. 16.

COMPREHENSIVE PLANNING IN STATE LEVEL DECISION-MAKING FOR HIGHER EDUCATION

Paul E. Lingenfelter, Illinois Board of Higher Education

The term program budgeting is generally used to describe a decision-making process which:

1. Identifies and examines the objectives of each program or activity under consideration.
2. Analyzes the outputs of these activities in terms of their objectives.
3. Analyzes past program costs and projects objectives, activities, and program costs into the future.
4. Analyzes program alternatives in order to determine the most efficient and effective means of obtaining objectives.

All of these characteristics suggest a method of decision-making in sharp contrast to the legislative budgetary process described by Wildavsky (1964) in *The Politics of the Budgetary Process.* Wildavsky found budgetary decision-making in Congress to be *experiential, simplified,* and *incremental.* Legislators tend to rely on past experience and earlier appropriations to guide their budgetary decisions, and they seem to be less influenced by sophisticated analyses than they are by gross, "common-sense" analyses and their subjective assessment of an agency head's competence. Agencies tend to ask for more than they expect to receive and legislators tend to appropriate an amount that is a small increment greater than the previous year's appropriation. According to Schultze (1968) "PPB (Program, Planning, and Budgeting) seeks to replace, at least in part, [this] pernicious practice of incremental budgeting" (p. 23).

Implicit in Schultze's statement is the assertion that program budgeting will produce appropriations decisions which are superior to decisions made through incremental budgetary procedures. Presumably PPB will give decision-makers the information necessary to identify inefficient, ineffective programs and more cost-effective alternatives. Armed with such information legislators can presumably maximize cost-effectiveness by reallocating resources.

Of course, the powers of PPB have been widely disputed. Some suggest that it is impossible to develop the information and analytical skills required for comprehensive planning on the scale proposed by PPB. Others of a more cynical stripe contend that political decision-makers would not or could not use rational analysis, even if PPB procedures were perfected. The pertinence of these criticisms to state level budgeting for higher education is the subject of this paper.

The Impact of Comprehensive Planning—An Empirical Test In Three States

The difficulties involved in assessing the output of any of the multifarious programs subjected to the scrutiny of program analysts are compounded when one attempts to analyze the output of a program budgeting system. Hence, in an exploratory study recently completed, I settled on a simple criterion for the effectiveness of PPB. If PPB is an effective tool to help legislators make more rational, less incremental decisions, the decisions made in states using comprehensive planning techniques should be qualitatively and quantitatively different from those made in states without such techniques. *Ergo,* decisions made with the assistance of comprehensive planning techniques should appear less "incremental" than those made without these techniques.

In order to test this hypothesis I examined institutional requests, governors' recommendations by institution, and legislative appropriations for the years 1963 to 1974 in three states—Illinois, Michigan, and Wisconsin. Illinois did not use program budgeting techniques until the end of this period, but its Board of Higher Education is generally conceded to be one of the stronger statewide agencies charged with comprehensive planning for higher education. Wisconsin developed one of the model program budgeting systems among the states during this

Figure 1
VARIOUS MODELS FOR PREDICTING APPROPRIATIONS DECISIONS

Model	State	N	R^2	β	β Sig.	Constant	Constant Sig.
A. Previous Appropriations Predicting Requests	Ill.	91	.986	1.21	.0000	1860.	.03
	Mich.	156	.993	1.270	.0000	879.	.0002
	Wisc.	40	.973	1.301	.0000	22404.	.0001
B. Previous Appropriations Predicting Governors' Recommendations	Ill.	117	.985	1.063	.0000	2127.	.0007
	Mich.	156	.997	1.098	.0000	113.	.1121
	Wisc.	40	.986	1.25	.0001	15835.	.0001
C. Request Predicting Governors' Recommendations	Ill.	97	.988	.881	.0000	430.	.49
	Mich.	160	.996	.859	.0000	179.	.195
	Wisc.	46	.996	.950	.0000	-3880.	.088
D. Request Predicting Appropriation	Ill.	96	.991	.875	.0000	363.	.52
	Mich.	148	.991	.853	.0000	-158.	.50
	Wisc.	38	.989	.966	.0000	-12335.	.0016
E. Governors' Recommendations Predicting Appropriation	Ill.	116	.998	1.001	.0000	-86.	.71
	Mich.	147	.997	.9933	.0000	111.	.43
	Wisc.	38	.996	1.0051	.0000	-5725.	.035
F. Previous Appropriation Predicting Appropriation	Ill.	108	.991	1.070	.0000	1610.	.0017
	Mich.	140	.993	1.086	.0000	832.	.0002
	Wisc.	32	.985	1.247	.0000	13307.	.006

Figure 2
PREVIOUS APPROPRIATION PREDICTING APPROPRIATION IN ILLINOIS, 1962-74

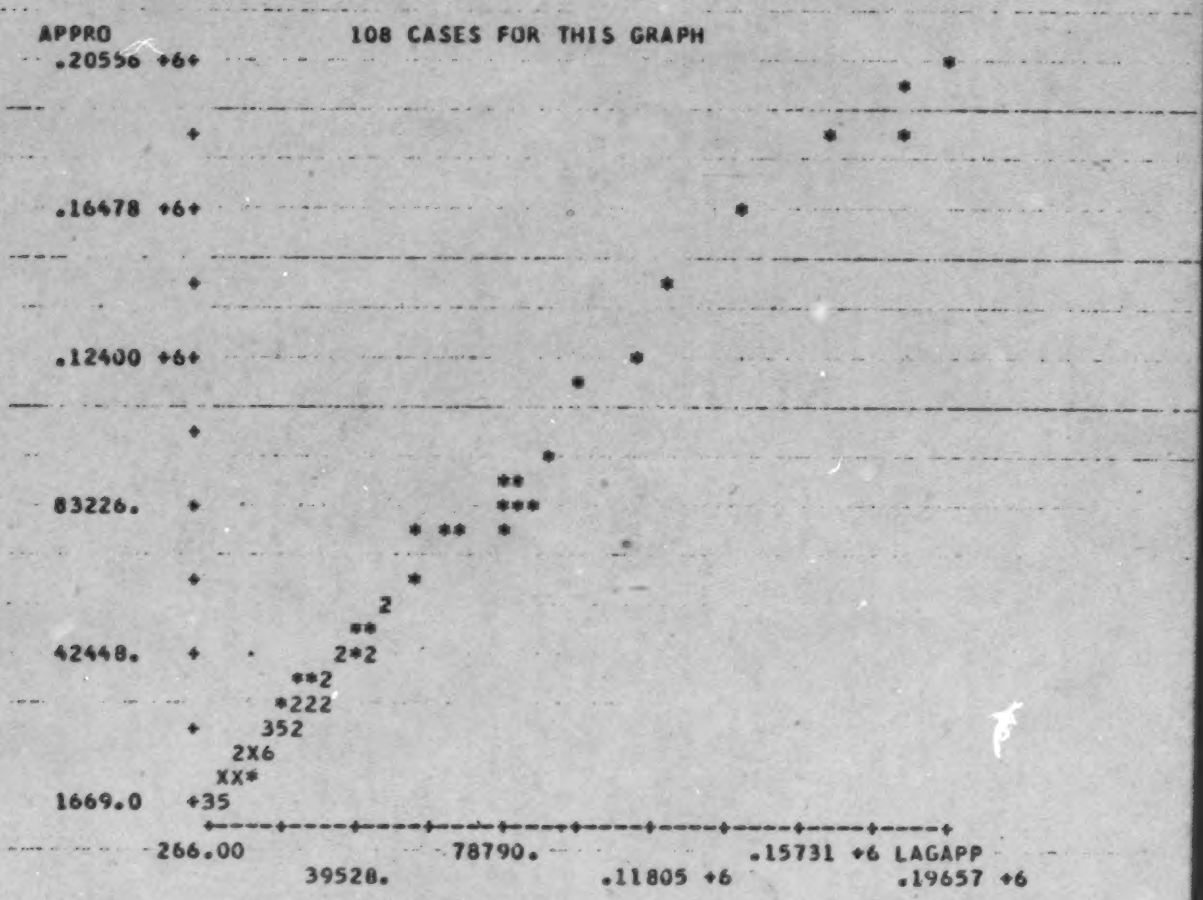


Figure 3
PREVIOUS APPROPRIATION PREDICTING APPROPRIATION IN MICHIGAN, 1963-74

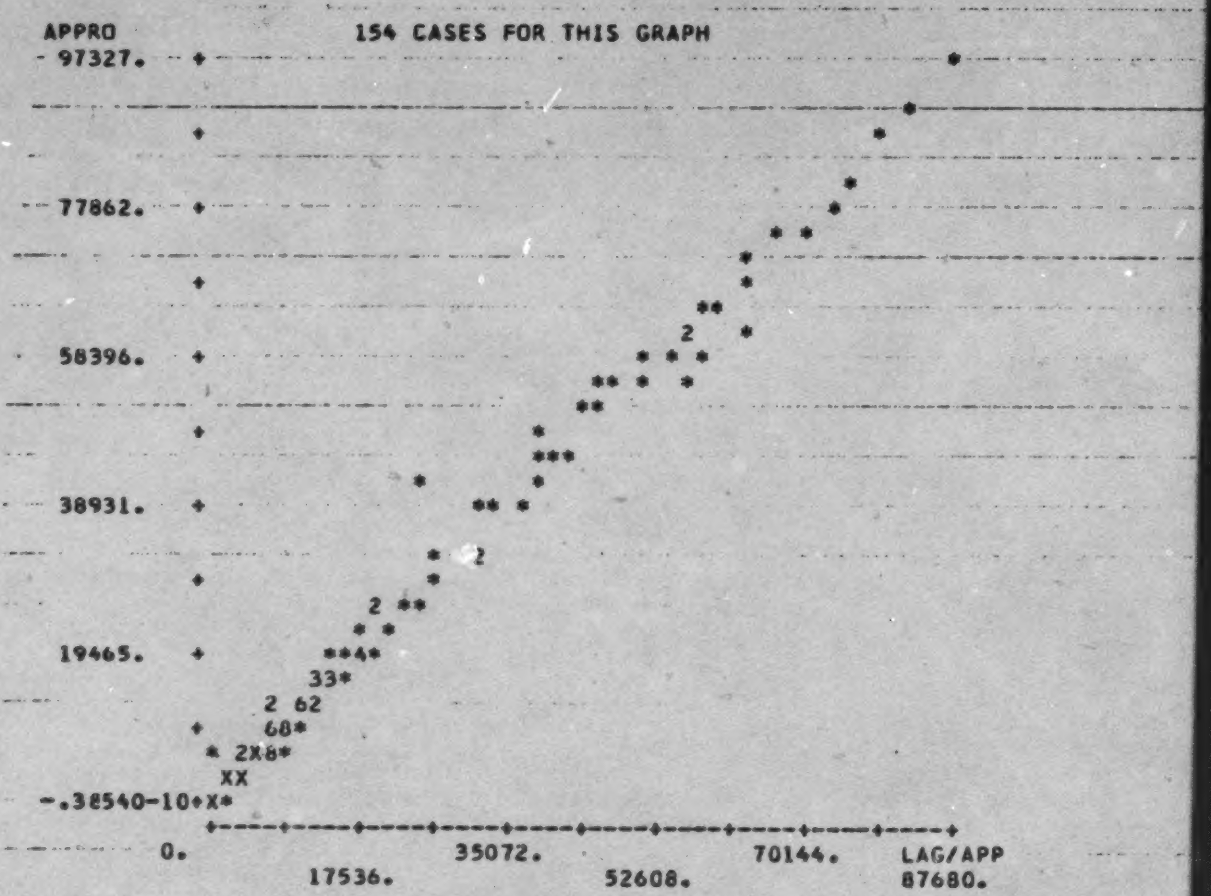
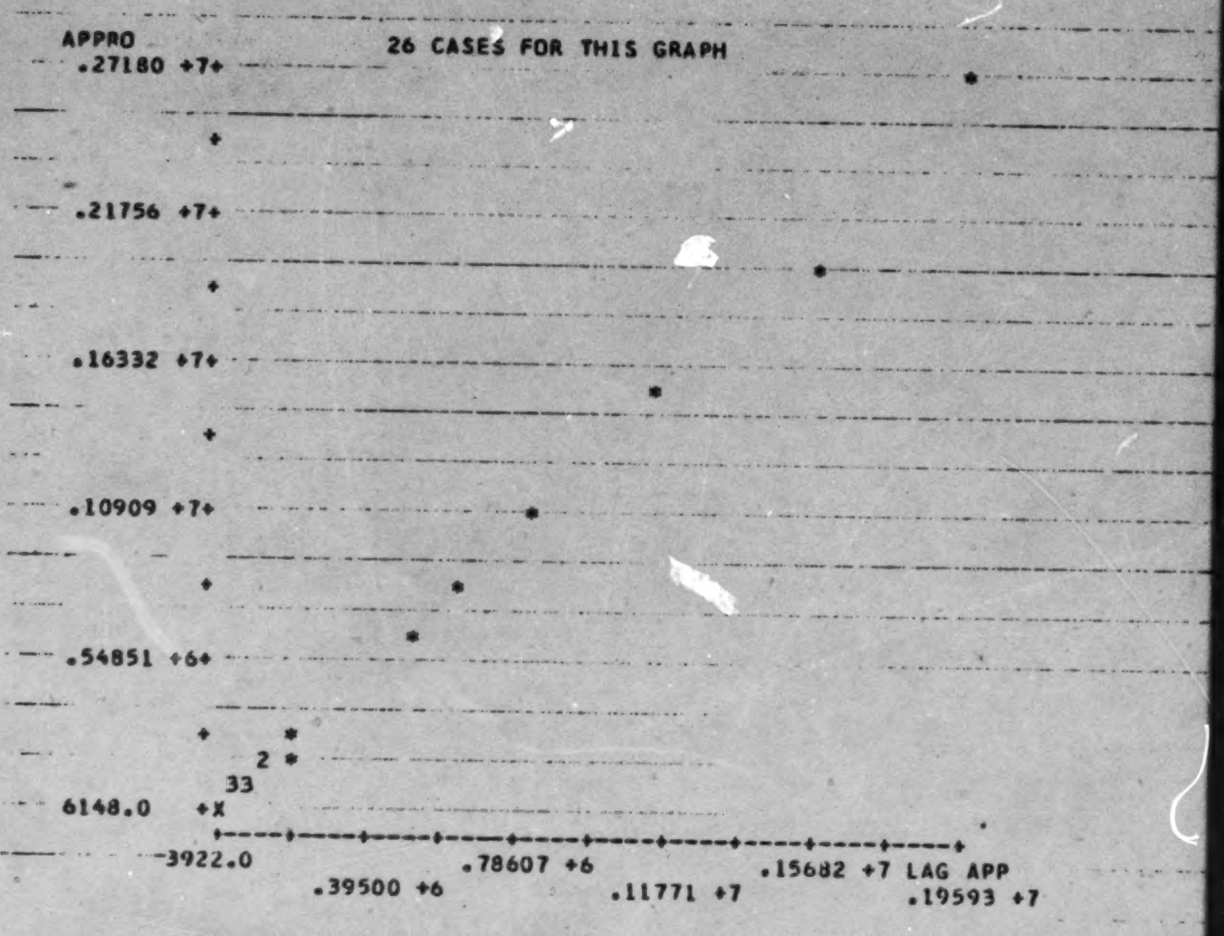


Figure 4
PREVIOUS APPROPRIATION PREDICTING APPROPRIATION IN WISCONSIN, 1962-75



period and had a statewide coordinating agency until, in 1971, its two university systems were merged under a centralized governing board. Michigan had neither an effective statewide coordinating agency nor a program budgeting format during this period.

Several linear regression models based on models developed by Davis, Dempster, and Wildavsky (1966) to simulate the incremental budgeting process were applied to the institutional budgetary data collected in these three states. These models predict budgetary decisions at each stage of the appropriations process on the basis of past decisions in the process. The units of analysis in this modeling exercise were the specific elements of the budgetary process—request, governor's recommendation, and legislative appropriation for each state institution in each budgetary year. If my hypothesis concerning the impact of comprehensive planning and program budgeting were to be supported, the pattern of budgetary decisions in Wisconsin might appear less incremental than the pattern of decisions of Illinois, and both of these states should certainly show less "incremental" decisions than Michigan.

As Figures 1 through 4 show, budgetary decisions at every step of the budgetary process may be predicted extremely well by antecedent budgetary decisions in all three states. In all three states requests may be predicted extremely well by previous appropriations, governors' recommendations may be predicted extremely well by requests and previous appropriations, and final appropriations may be predicted extremely well be previous appropriations, requests, and the governors' recommendations.

Although this analysis should not be blithely generalized to other states nor to future periods of time, it strongly suggests that stability is the dominant characteristic of the higher education appropriations process. Whatever the impact of comprehensive planning techniques may have been in these states, they have not effected significant redistribution of resources nor have they produced appropriations patterns which differ from those found in a state not using comprehensive planning techniques.

A Model of Appropriations Decision-Making

A number of interviews with individuals involved in the appropriations process in these states suggested that the politics of higher education appropriations follows the classic, interest group model of political behavior. This helps explain the stability of appropriations decisions over time and the apparent failure of comprehensive planning techniques to produce non-incremental decisions.

Decision-makers at the state level consider every alternative in terms of its impact on interested groups and individuals in the state. Other factors may be considered but most politicians believe that a certain way to have a short career is to ignore interest groups. Established higher education institutions actively pursue and defend their interests in the political arena. Although the power of institutions may vary, each institution, almost by the fact of its existence, is able to command some support in state government. In coalition, institutions can command significant support because a large number of voters and economic interests have a stake in the welfare of higher education.

These factors quite naturally militate for continued support of higher education institutions along the lines established by past appropriations. Influential individuals may develop a non-incremental policy preference (based on comprehensive planning, political utility, or other personal values), but the pursuit of that policy preference will be heavily influenced by the support or opposition it generates among other individuals with influence in the appropriations process. Political actors have a limited supply of political "capital"; they are unlikely to waste their resources in a hopeless effort to obtain a policy outcome which is widely opposed.

Figure 5 is a simplified schematic representation of the decision-making processes observed in the state agencies, legislatures, and executive offices of the three states. Although in places the model speculates thought processes that cannot be observed directly, it is based upon actual interview data in these states. The major components of the model are:

1. *Policy preference formation,* depicted on the top row of the model.
2. *Feasibility testing,* depicted on the second row of the model.
3. *Pursuit of policy objectives,* depicted on the third row of the model.

Almost by definition, non-incremental, redistributive policy objectives will arouse opposition in the appropriations process. Individuals seeking such objectives usually abandon their pursuit early in the process. The successful pursuit of a non-incremental policy requires substantial political capital ("clout" in some states), high motivation, and in most cases, some unusual event (such as a campus riot) which saps the political resources of those who would oppose change.

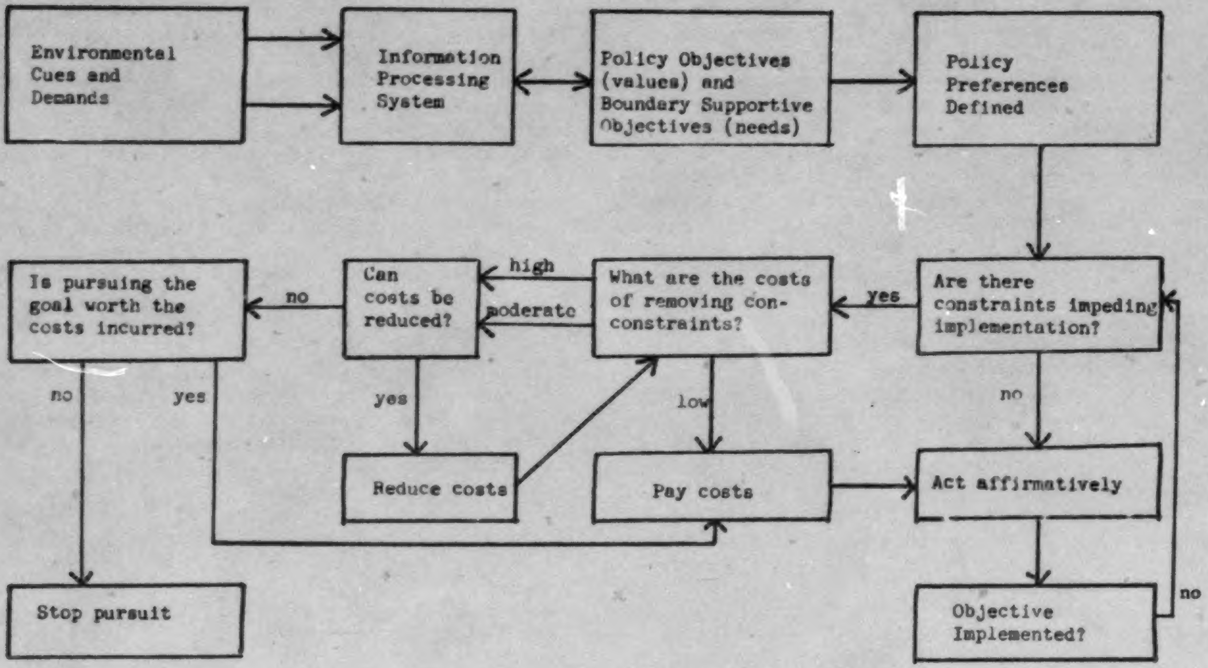
The Uses of Comprehensive Planning in the Political Environment

A popular view of the political process is that it is hopelessly irrational at worst and, at best, incapable of responding effectively to changing conditions and needs. Some, finding support for these assertions in the data presented above, may conclude that comprehensive planning efforts are wasted in the political arena of state-level decision-making. I am not quite willing to accept either this judgment of the political process or the conclusion that comprehensive planning is not useful at the state level.

The data reported show that appropriations for public colleges and universities are stable, predictable, and incremental. They do not show that these decisions are irrational. Most institutional representatives would agree that sharp increases or decreases in appropriations for a single institution would have negative consequences likely to outweigh the benefits obtained. Sharp increases do not allow for orderly planning and efficient utilization of resources, and sharp decreases strain the adaptive capabilities of an institution and reduce the income of individuals and economic organizations which serve the institution. It is little wonder that significantly non-incremental change is resisted, or that the likelihood of successfully achieving a non-incremental change is inversely related to the size of the proposed change. Clearly one function of representative government is to insure that the rate of change in governmental policies does not exceed manageable proportions.

These assertions, however, do not rule out a useful role for program budgeting and other comprehensive planning techniques in state-level decision-making. Program budgeting techniques provide information to guide the formation of policy objectives for individual decision-makers at the state level. Moreover, information and analysis have *some* influence on decison-makers, and information generated through PPB techniques may be a useful resource in the political processes

Figure 5
A MODEL OF APPROPRIATIONS DECISION-MAKING


Environmental Cues and Demands
Information Processing System
Policy Objectives (values) and Boundary Supportive Objectives (needs)
Policy Preferences Defined
Are there constraints impeding implementation?
yes
What are the costs of removing con-constraints?
high
moderate
Can costs be reduced?
no
Is pursuing the goal worth the costs incurred?
no
yes
yes
Reduce costs
low
Pay costs
no
Act affirmatively
Objective Implemented?
no
Stop pursuit

through which decisions will be made. While it is unlikely that PPB techniques will have sufficient impact on higher education appropriations to reduce significantly the predictive power of the quantitative incremental models of decision-making used in this paper, PPB techniques have been used and will continue to be used to provide a rational direction for change in higher education even if change must occur through relatively small incremental steps.

An example of this role for comprehensive planning techniques occurred recently in Illinois. A program cost analysis developed by the Board of Higher Education staff revealed wide disparities in the cost of similar programs in state universities. A reallocation of funds from the relatively expensive institutions was used to support new programs developed in the entire state system. If the entire amount of "over-funding" identified had been reallocated, or if the over-funded institutions had been given no new program funding, the impact of the reallocation would have been devastating on these institutions. (Moreover, the Board's recommendation would never have survived the legislative process.) Instead, only one-third of the over-funding was reallocated, and all institutions were given new program money. A quantitative analysis of these budgetary decisions would look much like the data reported earlier. However, even though the change from the previous year's appropriations is relatively small, a careful analysis would show that the high cost institutions received a percentage increase two to five percentage points lower than that received by the other institutions.

This interpretation of PPB's role in state government indirectly addresses the widespread concern that comprehensive planning techniques will provide a means for ill-advised bureaucrats or politicians to make capricious decisions which wreak havoc on higher education. To me, this concern implies the rather curious notion that bureaucrats and politicians will become more capricious and ill-advised as they become better informed. In my experience the lack of good information has never prevented an ill-advised state official from pursuing a capricious policy objective.

Although the information available to decision-makers in a PPB system may provide some temptation to pursue sweeping changes, I believe the independent power of budgetary techniques to stimulate such behavior is vastly overrated. Governors and legislators pursue sweeping changes because they believe a change is needed and/or because pursuing change works to their political advantage. The depths of their conviction and their political power are much more important factors than the budgetary system they use. Public institutions must protect themselves from capricious political actions under a PPB system in the same way they protected themselves before PPB was developed. They must work in the political process to protect their interests and to promulgate their conception of the public interest.

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PROGRAM BUDGETING: AN EVALUATION FROM ACADEMIC PLANNING, BUDGETING, AND SYSTEM PERSPECTIVES

Arthur L. Gillis,
University of California—San Francisco

An increasing number of campus officers charged with academic planning and budgeting responsibilities have had numerous occasions to work with deans and department chairmen in program budgeting techniques. The process of education that both groups have gone through—the chairmen in the process and the campus officers in the politics of academe—has resulted in many observations and conclusions in regard to program budgeting and its relative success or failure on higher education campuses.

The impetus toward program budgeting systems has come largely through government. Several state governments now require that all departments conform to Planning Programming Budgeting (PPB) routines, and more have set deadlines for future conformance. Thus, the state-supported universities are the ones most heavily involved in making the changes necessary to meet the new requirements. It appears, however, that in some cases the combined effects of time limitations, pressures exerted by the State, and stubbornness on the part of the University have led to a uniformity in adversary relationships rather than in form or substance of compliance. The chief problems in accommodating education to program budgeting systems appear to be the construction of the program budget and the lack of agreement on standards of definition or in evaluating the quality of performance. It is also accurate to say that many of those who have experienced these systems at the college or departmental levels find many more problems with the process and its products as they relate to compus political environments.

How do we in universities look at these systems—what can they do for or to the educational process? The evidence is all around us that our universities are neither adequately prepared nor enamored of the changed agenda requiring planning programming budgeting systems.

I believe that a prerequisite for the successful use of program budgeting is a favorable predisposition to its use. Having been introduced simultaneously with fiscal retrenchment in higher education, many people view program budgeting as documentation for less. Unless there is a strong belief that this system will make a positive contribution and that this contribution is needed, program budgeting will remain an unrewarding exercise. Also, this system requires a thought pattern that runs in quantitative channels. With most department chairmen this change will be difficult, if not impossible. Heim (1972) stated the problem in applying program budgeting at the departmental level quite well: "The main problem seems to be that academicians practice what might be called ivy-halled personal-factor administration."

The higher levels of University administration regard the departmental chairman as a first-line supervisor, responsible for interpreting and enforcing university policies and regulations and for making sensible allocations of the department's resources. Department members regard the chairman as a colleague and as their agent in bringing to the department what it needs from the university administration. In situations of conflict and scarcity, the chairman cannot be totally satisfying to both groups all of the time.

With the frequent rotation of the chairmanship now more the rule than ever before, there are some major consequences for systems like program budgeting. In departments there is an emphasis on collegiality and consensus methods of operation. The incumbent is aware that next year or the year after, the colleague with whom he must disagree, or on whom he seeks to foist an unwelcome decision, may be the chairman instead of himself. Furthermore, these rotations produce a quite variable skill of administration over time, since the capacity for administration is unevenly distributed in a typical group of university faculty members. This amateur and uneven capacity results in the devolution of power on administrative staffs who are relatively unprepared to deal with program goals, objectives, and evaluations.

The foregoing illustrates one reason why program budgeting is not successful within many institutions. Many chairmen do not possess the understandings and skills necessary in the use of management systems. If they have not been thinking in planning and program budgeting terms in their disciplines, they do not know what systems can do or cannot do or how to use them.

There is another important element involved in the meaningful utilization of planning programing budgeting systems. If management and planning systems are to make a major impact in improving institutional decisions, the university president must be an ardent follower of the approach and must secure its application throughout the institution. How many presidents have given more than lip service to program budgeting? Institutions are faced with many hard decisions today. Any hard decision is painful. It means bestowing resources on one; denying them to another.

How many chairmen or deans or presidents will consult the program budget report and follow its logic for decision-making? Why?

These factors raise a critical issue—is program budgeting appropriate to the organizational structure and practice in effect in universities today? Or may its likely benefits be overstated for educational organizations? We must, as stated earlier, consider the political milieu of higher education. Against the personal diplomacy background of higher education it is important to note that program budgeting tends to stress the economic or resource allocation functions of the political system and virtually ignores demands and allocations which are primarily value-laden or which re-distribute political power. In short, while program budgeting can help clarify the relative economic-resource costs and benefits of education, there are relative social-value and political power costs and benefits which are not taken into the balance of accounts.

Every political system has some formal rules which provide for the government of its institutions. Some of the rules, like the division of powers between the university president, the deans, and the faculty, play havoc with program budgeting because program budgeting assumes a political system that can authoritatively establish goals and objectives.

Political systems also have customary patterns of operation or norms, which informally govern the system. Hence, a decision-making tool like program budgeting which has "normed" in a political environment governing defense appropriations at the national level may have serious limitations when used in a political system (the university) whose norms do not follow the customary patterns.

Conclusion

The assumptions of program budgeting may obviate many of the realities of the political process on campuses, its norms, rewards, and sanctions. Furthermore, program budgeting systems lose much of their utility in higher education because most educational objectives, for a variety of reasons, defy precise identification and quantification in their definition.

This treatise is far from complete in addressing the past, present, and future of program budgeting in higher education. Further research in the areas of accountability, productivity, student evaluations of teaching, academic planning, and evaluation, as well as theories of resource allocation and their relationship to the system approach to higher education is required. We must reexamine the assumptions of program budgeting systems, refine their conceptual parameters, and thereby hopefully increase their relevancy to campus management.

Rational decision-making—is higher education ready for it? I think not, unless we clothe the skeleton of program budgeting with a form and fit appropriate to the environment of higher education.

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DATA FOR STATE BUDGETARY DECISIONS: ARE CENTRALIZED HIGHER INFORMATION SYSTEMS WORKING?

Richard J. Meisinger, Jr. and Ralph A. Purves,
University of California, Berkeley

An information explosion fueled by increasing demands for centralized information and made possible by a rapidly advancing data processing technology is occurring in all sectors and aspects of management. Not surprisingly, this explosion also characterizes the management of public higher education. As in other sectors of management it is not entirely clear which of these two forces, technology or the demand for information, is most heavily influencing the trend driving the process.

In a recent study of state budget processes for higher education in 17 states, we found widespread interest in information and centralized data gathering systems, but extremely uneven implementation and use of systematized information.[1] This paper discusses some of the expectations held out for these information systems, the current development of these centralized systems with respect to state level budgeting processes, and some of the organizational and political obstacles which hinder system development. The technological progress in information collection clearly exceeds the sophistication and awareness of the many behaviorial constraints affecting implementation. However, the problems usually discussed concern technological aspects of information reporting rather than behaviorial features. This focus is doubly inappropriate if the concern over data collection is symptomatic of a loss of trust between agencies and between higher education and the public rather than an instance of information failure. In this paper we restrict discussion to significant organization and political issues because it appears that they have been insufficiently emphasized in current policymaking.

Expectations

Restricting the discussion to the more pragmatic consequences of expanded information access and centralized information flows, proponents of centralized data collection systems suggest that some or all of the following will result:

1. An improvement in the logic and rationale of budgetary choices.
2. Better management and efficiency of the institutions themselves since the information a centralized information system requires is useful to the institution itself.
3. Greater institutional fiscal control and accountability.
4. A reduction in multiple requests for information on the part of responsible state agencies.[2]

Also, it seems to be generally assumed that in a time of budgetary stringency and leveling resources greater information flows will be useful in trimming back budgetary demands. This premise follows from the time-proven principle that knowledge (information) is power, and the expectation that information will limit the bargaining power of institutions.

On the face of it these expectations do not seem unfounded. However, many of them bear a resemblance to the general articles of faith that management needs the information it gets and can use the information it wants, two assumptions that have been challenged repeatedly (Ackoff, 1967).

As in the application of other methods of management improvement, both institutional executives and state-level administrators probably expect too much of improved information in the budget development process. Frequently, improved data collection systems are seen as the remedy for a wide range of deficiencies in inter-organizational relationships. It should be noted that many information reforms have been started within the last two budget cycles, so that all the results are not yet in to allow for a comprehensive review of the state of the art.

Current State of Centralized Data Collection System Development

Given the above expectations, a centralized state-level information system for higher education may take a variety of forms. Whether the system is manual or computerized, it appears essential that it have the following components in some form:

1. Institutional data collection on such areas as business transactions, budget, employed personnel, students, and facilities.
2. Standardized aggregations and definitions for coding of the data.
3. Reporting system to a central source (scheduled, manual, or machine-readable).
4. Central storage (manual or automated memory).
5. Resources for decoding, retrieval, and distribution by the central source.

These five components deal only with the routinized collection of information. If information systems are to have any impact on the budget process, analysis of the information is essential. However, analysis must often be geared to a particular policy environment and is not as easily routinized as the collection and storage process.

Implementation of these five or similar components of centralized information systems and subsequent analysis has been very uneven across the states. Based upon our findings of what state agencies actually do, it appears that the state-level interest in centralized data collection systems has been precipitated by the increasing *ad hoc* demands for information made by individual agencies. However, attempts to develop comprehensive systems which would encompass these demands are relatively new. In particular, it appears that the ability to analyze institutional data has probably been exaggerated.

The institutions have, in general, made great strides in collecting information about themselves. Many have participated in National Center for Higher Education Management Systems (NCHEMS), College and University Systems Exchange (CAUSE), National Association of College and University Business Officers (NACUBO), and other workshops in order to implement various data collection structures and procedures. In some instances the resulting data systems are partially or wholly automated.

Coding of data according to standard definitions and aggregations is well underway, but dealing with higher education data involves a number of particularly difficult problems that understandably have not been resolved to everyone's satisfaction. Difficulty in specifying outputs of higher education and in obtaining agreement on allocation procedures for separating the joint production processes of instruction and research are two such problems. The data structures developed at NCHEMS have been adopted in some degree by many states, mostly to the point of identifying the major programs of the institutions. Furthermore, the accounting structures for most institutions are based upon the functional accounts developed by NACUBO, and in most institutions the discipline categories developed for the Higher Education General Information Survey (HEGIS) are also used. However, the impact of these data structures on the budget process is often indirect because the organizational structures and decision processes of the institutions do not necessarily change with their new data structures and systems.

There is a greater centralization now than ten years ago of the information collection function under the state higher education agencies. To the extent that there is central collection of information the function has been generally assumed by the state higher education agency, be it an office of the state department of education, a coordinating agency, or a statewide consolidated governing board. With few exceptions executive budget offices and legislative fiscal staffs appear willing to leave this responsibility with the higher education agency whether the state is just beginning to implement some centralized process or is already committed to such a system. These agencies responsible for data collection generally have a designated information officer with a title such as director of information systems or information coordinator. This central reporting process has become institutionalized to the greatest degree in those states with consolidated governing board systems as in the University of Wisconsin System, State University System of Florida, the University of Hawaii System, or the Board of Trustees of Institutions of Higher Learning in Mississippi.

In most states centralized reporting takes place largely through submission of budget requests. That is, data to be used in reviewing budgets is appended to the budget request by the institutions. Other data reporting activities such as HEGIS may be centralized, but these rarely have any opportunity to influence the budget process.

Automated central data files of budgetary information rarely exist. The State University System of Florida has such a capability with its routine submission of data tapes by institutions, and the Senate Fiscal Agency in Michigan has such a system based on manual data submissions. This developing capability is more likely to be found with the staffs of consolidated governing boards because they have greater power to obtain data and more need to use it for internal management purposes than do other types of agencies. With respect to other state agencies, a number of executive budget offices and legislative fiscal bureaus use automated systems for tabulating budget changes and recommendations during the review process.

Retrieval of information has become sufficiently sophisticated in a few states that information can be supplied in various formats through the use of crosswalks. These have been used quite effectively to cross-categorize program or functional information by object of expenditure class categories.

In the 17 states examined we noted that analysis of information in the budgetary process tends to be simple and abbreviated, in part a consequence of time constraints. The evaluative features of analysis may be limited to making a few straight-forward comparisons, and in most instances such analysis at the state level concentrates on additions to last year's budget. Quite frequently, reliance on standard operating procedures or rules of thumb such as formulas replaces or subsumes analysis. When comparisons are made they usually focus on various indicators or tests of reasonableness, such as measures of productivity, student-faculty ratios, or unit costs of one sort or another. These generalizations cannot do justice to the analytical efforts of some state agencies and they no doubt exaggerate what takes place in others. However, the vast bulk of state agency analysis is of this cursory nature.

In the context of the five components noted, several other observations can be made relating to trends in the development of centralized data reporting systems. In some states implementation of information gathering procedures has been associated with the development of Planning Program Budgeting (PPB) Systems, either for higher education budgeting or budgeting for all state services. Since these systems could not be implemented over a short period, it has been necessary to carry along information in at least two different structures. Information for the traditional budget system has been continued while budget data for the new PPB system is developed. Consequently, several states have parallel budget submissions and, therefore, a relatively heavy information load. Connecticut, Michigan, Hawaii, Pennsylvania, and Washington are states which have attempted or are attempting to implement a program budgeting system and have a designed redundancy in their budgetary information systems.

The demand for more and better information has frequently led the legislative fiscal staff or the executive budget office to prod the state higher education agency into developing more extensive systems for higher education. In Colorado, Nebraska, Hawaii, and Michigan legislative interest in systematized higher education information was particularly high. However, only in Michigan has the legislative staff itself undertaken the job of implementing comprehensive information collection. In California and New York state budget offices have stimulated information system efforts in the multicampus systems of the state.

Although it is not universal, the development of information systems has in some instances served as a substitute for state controls over institutions. In New York the development of an information system for the State University of New York system was a condition for relaxing certain controls or budgetary practices previously practiced by the Budget Division. Similarly, the state college system in Pennsylvania has regained certain personnel management prerogatives as a consequence of providing information to state agencies. This is not to say that public higher education has generally come under less control by state agencies, but rather that such controls are not linked in a direct way with greater information reporting. The control that is exercised through position control, pre-audit, and line-time appropriations may be extensive. The tendency to use these devices appears to us to be unrelated to the provision of information except in some instances where state agencies have relaxed such controls under the condition that institutions or systems report more fully on their own operations.

Obstacles To The Implementation Of Centralized Data Collection Systems

The degree to which the various expectations held by proponents of management information systems are realized varies from state to state. In all cases observed, the development of statewide management information systems has been hindered by a number of technical, organizational, and political constraints, with some states surmounting these obstacles better than others. The distinction between organizational and political obstacles to the implementation of centralized data collection systems on the one hand and technical obstacles on the other is a rather gray area, with overlapping boundaries. The evidence demonstrates, however, that considerably more attention is paid to the technical problems of implementation than to the political and organizational ones. Without sufficient attention to the latter issues, statewide information systems will never realize their desired potential.

Centralization of data collection has not been without its problems. It has not, for example, necessarily alleviated the information demand overload experienced by the institutions. Usually, the demand for information increases when there is a systematic way to collect it. Moreover, centralization has not reduced considerably the duplication of requests for information. Added to the demands imposed by the centralized data collection system are the ad hoc demands of other agencies which go directly to the institutions for information not readily available through the central systems. In these circumstances it is difficult to determine whether or not a centralized information collection system improves the efficiency and effectiveness of the budgetary process. Several political and sociological obstacles to the implementation account for this confusion.

Obstacle No. 1: Limited Resources Available to Collect Information

Information is extremely costly to collect, more so than most management information system designers claim or anticipate. For example, information specialists in Florida (with one of the most technically sophisticated systems in the country) did not anticipate the high costs of implementation. Thus, one must have a good notion of the most useful kinds of information for various decision levels before devising a system to collect it. The utility of cost data, for example, gets a mixed response across the states examined. Wisconsin collects cost data because they are used heavily in budget review and allocation processes. On the other hand, the Regents staff in New York does not collect very much cost data because they are of little use to the staff in program review. Thus, whatever the decision on the coverage of the information system, it must be congruent with the users' needs.

Also, consideration must be given to staff resources. If there are not sufficient staff members to analyze the information, there is little sense in collecting it. The staff size, not only of the collecting agency but also of other potential users—legislative fiscal staffs and executive budget office staffs—is an important issue. In Tennessee, Illinois, Wisconsin, Florida, and Hawaii the state higher education agency has a much larger staff devoted to information collection and budget review than do other agencies at the state level. Thus, these state higher education agencies are bound to collect and be able to use more information than the other agencies. Not unexpectedly, the larger states—California, Illinois, New York, Florida—have larger staffs at the state level and, consequently, have a greater information capacity than smaller states. A constraint facing a staff of any size is time. If, for example, an agency is allowed six weeks to revise the budget, only a limited amount of data can be assimilated.

The information system designer must consider as well the timeliness of the information to be collected. Much information is obsolete by the time it is processed; the biggest problem facing most users of centralized information collection systems is getting data on recent events. Designers are faced with the dilemma that the areas of greatest weakness in information systems are also those wherein information collection is so costly that it is prohibitive.

Obstacle No. 2: New Actors in the Budgetary Process

As the number of actors in the budgetary review process increases, the types and amount of information desired by all the participants in the process increase accordingly. Moreover, additional agencies lead to problems of timing, because each agency needs information at different times. A relatively new agency in the budget review process in most states (except in such legislatively-dominated states as Texas and Mississippi, and in California) is the legislative fiscal staff. Until recently, legislators depended upon harried legislative research staffs or the executive budget office staffs for information and analyses of agency budget requests. As legislators begin to seek a more active part in the budget review process, they establish special staffs to provide guidance and analysis on fiscal matters. Although some legislative fiscal staffs have existed for several years with small staffs, recently many such staffs increased their manpower to become comparable to and competitive with executive budget office staffs (and, at the same time, state higher education agency staffs). The proliferation of new staffs and the increases in staff sizes cause strains on existing or proposed information collection procedures.

Obstacle No. 3: The Newness of an Information Collection System

While the term "centralized information system" is used rather frequently, very few states employ central automated information systems which service all or even most of the needs of all state agencies. The quality and quantity of service that the central information collection agency provides varies widely. Consequently, in all of the states examined, other state-level agencies collect some of their own information. Is this redundancy in the information collection process necessary? Yes, in part, because some desirable information is not obtainable through the information system. Just as important, some of the information reported by new data collection systems is unfamiliar to the user. New information requires new analyses, which take time to prepare. A change in traditional channels of information flow triggers for organizational actors an increase in uncertainty until the use of the new system becomes routinized. In every state studied this uncertainty is reduced through practice with the new system. In the meantime, however, agency staffs continue to seek the kinds of data with which they are familiar, usually through ad hoc requests directly to the institution in question.

One obstacle to the implementation of a centralized information system, especially one built upon the NCHEMS Program Classification Structure categories, is the resistance of legislators and, to some extent, their staffs, who argue that information is too aggregated by the PCS categories to be of much use. Many legislators want information on organizational units by object of expenditure because they have become accustomed to working with such information. It is much easier to compare object lines across state agencies than it is programs—programs are by their nature particular as well as complex, and do not easily lend themselves to comparison. Attention to the details of budget requests is the traditional incremental style which discourages evaluation of programs themselves. As legislative staffs become seasoned and familiar with the latest in information system formats, resistance to the more programmatic data elements may subside. The burden then falls to the legislative staff member to make the crossover from his analysis to a recommendation which the busy legislator can grasp. Several state information systems—notably the Illinois Board of Higher Education's Resource Allocation and Management Program (RAMP) system and Hawaii's disaggregation of program data by line cost categories—include crosswalks to make existing data more usable to different parties.

Obstacle No. 4: Piggybacking Information Collection on PPB

The redundancy of information requests is characteristic of states which have sought to introduce PPB into their budgetary processes. Program budgeting provides information on programs rather than on organizational units. As noted, it is not easy for a review agency to make the transition from one type of information to another. In Michigan the legislature failed to get the information on organizational units that it had formerly received. Consequently, the legislative fiscal staff issued its own requests for information, resulting in the equivalent of two parallel budget submissions and information bases. In Connecticut the executive budget office requires the submission of two different agency budget requests. This requirement is in addition to a third format requested by the Commission for Higher Education. The executive budget office's program budget format buries objects and expenditures in the PCS categories. However, before the executive budget office in Connecticut can move to program budgeting formats only, there must be some sacrifice of detail. Thus, different informational needs lead to some redundancy in budget requests of the Commission for Higher Education and the executive budget office. The Commission needs information in less detail than the budget office and uses an appropriate format. Similarly, institutions in Washington will have to prepare two sets of requests for 1975-77; one request will use the new program format, and the other will employ the existing formats. Although Hawaii does not employ a dual budget request format, it has encountered information collection obstacles in implementing its PPB system. Significantly, the program budget and related information of the University of Hawaii are not used by the executive budget office in its review, although allotments to the University are made in terms of programs. There is very little indication that the legislature is really using the program information either, although the legislature was the source of the mandated PPB procedures. These three cases have in common the fact that a new procedure—PPB—appears to be desirable in the abstract, but has associated with it problems of implementation. With sufficient modifications to fit more closely the particular environment and existing information collection and budget review procedures, some obstacles can be overcome and the problem of redundant information minimized. States such as Wisconsin and Florida which have introduced PPB have coped with some problems of redundancy by severely modifying the PPB approach to link it with the existing procedures and the available expertise.

Obstacle No. 5: Existing Accounting Structures

A serious obstacle to implementation of information systems is the need to fit information collection into the existing accounting structure, be it a statewide (state-imposed) accounting structure or a higher education systemwide structure. Frequently, individual campuses have their own accounting structures built around their programmatic and organizational features. When attempting to implement an information system, it is difficult to mesh the various accounting procedures. This meshing could be viewed as a technical problem, but it is also a political one. Institutions and systems of higher education reluctantly trade their established procedures for another set of rules. They not only know how to operate best within their own rules, but are concerned that somehow a new accounting or information system will expose the institution in some unanticipated way. Technically, too, it is difficult to obtain comparable and compatible data across institutions within a state or across systems within a state.

Obstacle No. 6: Involving the Sources and Users of Information

The active participation of the higher education community and potential users at the state level can facilitate implementation of data collection systems. Such involvement not only conveys to the state agencies knowledge of what information exists and is collectible at the institutional level, but it also gives the institutions some indication of what information is required by the state-level agencies and how these agencies intend to use the information. Such a discussion tends to alleviate somewhat the institutional concern that the information will be used "against the institutions." Across the 17 states examined, there is a wide range of participatory involvement in the development of the information systems. These practices range on the one hand from Connecticut, Florida, and New York, in which there was wide involvement of the institutions, to Illinois, where a private consulting firm developed the RAMP system with what the institutions claim was minimal involvement. Although the institutional executives in Illinois were asked what types of information would be of use to them, there appears to have been little involvement on the part of the institutional information experts. As a result of the small degree of institutional participation, the institutions have found it quite difficult to implement the system with the high standards set by the state. Connecticut has also brought in a vendor to design its information system, but has made extensive use of a committee of institutional representatives.

The degree of participation by legislative fiscal staff and executive budget office staff in the development of centralized data collection systems varied across the 17 states examined. On the one hand, the Joint Budget Committee in Colorado directed the Colorado Commission on Higher Education to develop an information schedule designated by the Joint Budget Committee to get at some of the legislative concerns. On the other hand, the Illinois RAMP system was developed with little input from the executive budget office and the legislative fiscal staffs. The significance of this input depends upon the degree to which the other user agencies analyze the basic data. In some cases, such as Illinois and Tennessee, the executive budget offices and legislative fiscal staffs depend heavily upon the analytical capability of the state higher education agency. The user agencies depend not so much upon the raw data as upon the recommendations based upon analysis.[2] Thus, the user agencies require less direct input into the development of centralized data collection systems since their informational and analytical needs are met by the state higher education agency.

Obstacle No. 7: Inadequate Feedback of Information to Sources

Another problem in initiating a centralized information system is to convince the institutions that the information needed at the state level also will help the institutions. Overcoming any reluctance is difficult, and usually requires several cycles of actual use before the institutions become convinced of its value. It should be noted that nearly all institutional administrators argue that the information furnished to higher levels is not of much use to campus users. Infrequently, campus administrators do make use of the information, to varying degrees. For example, Wisconsin's institutions were initially hostile to the idea of a departmental profile initiated by the University of Wisconsin Central Office. However, once the data collection exercise was underway, the institutions found that they actually used the data to answer questions from legislators and to support budget requests. The state-level designer of management information systems should be forewarned, however, that complete institutional acceptance of data demands at the departmental or school levels is an exception to the rule.

Equally important in selling the information system is the actual feedback of data to the institutions in a usable format. Feedback is not helpful if the institution receives only its own data. Feedback is an incentive to collect the data in the first place, and is an incentive for accurate reporting if the information supplier is also a user. The best system of feedback appears to be in Florida, where the data collected from institutions is stored on data tapes which are available to the institutions for the preparation of budget requests and for ascertaining their standing relative to other institutions. That is, institutions in Florida have access to data from other institutions as well as data is an effective way to enforce academic standards. In Tennessee and Washington, the state higher education agency makes every effort possible to feed back data to the institutions in the form of reports. However, the tendency even in these three states is to concentrate on the upward flow of information, with much less attention given to the potential usefulness of information or the feedback of the information to the institutions. The feedback problem is complicated by institutions not getting data from state agencies on economic trends and policy considerations.

Conclusion

The development of statewide centralized data collection systems for higher education has progressed much faster on the technological front than on the political and organizational fronts. It is time for state-level information system designers and users to assess their present circumstances vis-a-vis original expectations for the systems and to make some mid-course adjustments. In particular, proponents of centralized data collection systems must realize that improved systems will not in themselves improve the effectiveness and efficiency of the budgetary process. Many of the organizational and political obstacles to implementation of centralized data collection systems are manifestations of problems which beset all interorganizational relationships. These obstacles to interorganizational exchanges, which develop when organizations have different roles and hence different objectives, cannot be removed through the creation of centralized data collection systems. Therefore, state budgeters at all levels must scale down their expectations and realize that there is nothing magic about the information collection process which enables it to avoid the political and organizational problems encountered in any other set of relations between organizations.

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[1] The state budgeting processes in California, Colorado, Connecticut, Florida, Hawaii, Illinois, Kansas, Michigan, Mississippi, Nebraska, New York, Pennsylvania, Tennessee, Texas, Virginia, Washington, and Wisconsin were investigated as part of a study of state budgeting practices for higher education funded by the National Institute of Education and the Ford Foundation and carried out at the Center for Research and Development in Higher Education, University of California, Berkeley. The budget cycle examined was primarily that which involved preparation of the FY 1974-75 budget, and any data reported here pertain to that cycle.

[2] The report of the National Commission of the Financing of Postsecondary Education (1974) enumerates a similar list of benefits to be derived from the standardization and uniform reporting of instructional costs.

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HUMAN CAPITAL, THE RATE OF RETURN ON INVESTMENT IN EDUCATION, AND THE EFFICIENT ALLOCATION OF RESOURCES: CALIFORNIA AS A CASE

Bernard Kalscheuer and
G. Frederick Thompson,
Department of Finance, California

The term "human capital" arises from the economist's consideration of people as producers as well as consumers. In their roles as producers, people combine their skills with physical capital (buildings, machines, etc.) to produce goods and services. These human productive skills are called human capital because of their similarity to physical capital: like physical capital, human skills can be used to produce goods and services *in the future* as well as today; and, like physical capital, the stock of human skills can be increased through investment. Examples of investments in human skills include health care, education, job training, morale improvement, and information dissemination. In this study, however, we are concerned with only one of these: education.

Why do we consider education an investment? For one thing, the benefits of education are spread over the student's lifetime. But besides this, the potential student must decide whether education's *future* benefits are worth the income he must give up *today* to go to school. Since most college students cannot work full time, they earn lower incomes than if they were not in school. In other words, the college student must forego some income while in school; and to the student, this foregone income is usually the major cost of his education.

The rate of return on investment in higher education is a means of summarizing the economic costs and benefits of college education in one figure. Since it is analogous to the yields on other investments, the internal rate of return on higher education is a means of judging the profitability of a college degree. If we should find that the rate of return on education is low relative to rates of return on other public or private investments, then we might decide we are currently purchasing too much education. If, on the other hand, we should find a relatively high rate of return on education, we might decide to purchase more education at the expense of other investments. In any case, comparison of rates of return on different investments aids in determining whether society is efficiently allocating its resources to competing uses.

One of the goals, whether explicit or implicit, of the State's policy toward higher education is obtaining as many social benefits as possible from the funds it provides to that public program. Because higher education is only one of many socially desirable projects competing for scarce public funds, justification for the use of these funds to subsidize higher education must rest upon criteria other than the argument that education makes society better off; other public investments also make society better off. Higher education is a good social investment only if the benefits resulting from a given expenditure on it equal or exceed the benefits that would result from spending those funds on other projects. Efficient use of public funds requires that the social benefits resulting from the last dollar spent on education (i.e., the *marginal* social benefits) equal the benefits resulting from the last dollar spent on every other public project. If an additional $1 outlay would produce $5 of benefits if spent on higher education, but only $2 of benefits if spent on highway construction, then efficient utilization of public funds dictates that funds be allocated to education before any additional funds be devoted to highway construction. If the marginal relationships were reversed, then the funds should be spent on highway construction.

It is no doubt true that political issues play a larger role than do efficiency issues in determining how public funds are allocated to various social projects; but even so, public officials expect the funds devoted to each program to be used in an efficient manner. In the case of higher education, for example, we might ask whether funds are being efficiently allocated among disciplines or among student levels. If more benefits result from an incremental expenditure on undergraduate education than from an incremental expenditure on graduate education, then efficiency dictates reallocating some funds from graduate education to undergraduate education. If the marginal social benefits of the physical education program exceed the marginal social benefits of the law program, additional funds should be spent on the physical education program. If we find internal inefficiencies of this sort, then the public agency is not efficiently utilizing public monies. That is, the welfare of the citizenry can be increased by reallocating funds among disciplines or among student levels if marginal benefits differ across disciplines or student levels.[1]

Costs And Benefits Of College

Costs. It is customary to distinguish between the private and social costs of higher education. Private costs are those borne by the student and his family; they are tuition, fees, books, supplies, travel, and living expenses *in excess of*[2] what they would be if the person were not in school, and, most important, foregone earnings. Foregone earnings are the difference between what the student could have earned if he had worked full time and what he actually earns. All earnings figures are net of taxes on the presumption that persons respond to net earnings in deciding whether and how much to invest in education.

Social costs equal the private costs plus the costs of operating a college that tuition and fees do not cover, i.e., the public and private subsidies. In addition, because social costs measure the value of the output society must forego while the student is in school (not just the take-home pay the student must forego), earnings figures are gross of taxes.

Benefits. Again, we distinguish between private and social benefits of higher education. Private benefits, in addition, are subdivided into monetary benefits and nonmonetary benefits.[3] The monetary benefits of higher education are the increased earnings resulting from a college degree, i.e., the difference between the net earnings from a job requiring a high school education and the net earnings from a job requiring a college education. An example of a private *nonmonetary* benefit would be the desirability of the academic environment relative to alternative environments. Another possible nonmonetary benefit is the college graduate's ability to appreciate certain forms of art, music, and culture he might not enjoy had he not gone to college.

Social benefits traditionally include the private benefits listed above; but this stems from a belief that individual preferences should matter to those who make public decisions. If, on the contrary, public decision-makers feel that personal preferences for such things as a "contemplative life" do not provide social benefits, then these private benefits will not enter into the calculation of social benefits.[4]

Benefits that should be treated as social benefits of education include the gains to subsequent generations of a better-educated ancestry, improved participation in the political process, political stability, competent leaders, a citizenry that is amenable to change, and reduced public expenditures on welfare, police, etc. These are all benefits that accrue to persons besides those receiving the education; that is, they are "external" benefits.[5] Unfortunately, these benefits are difficult, if not impossible, to measure. Furthermore, it is not clear that these benefits result from all forms of higher education; historically, they appear to have come from *general* education.

It is commonly assumed that these external benefits are so great as to justify almost any expenditure on higher education. Yet, it has been impossible thus far to demonstrate the existence of the external benefits much less measure their significance. Milton Friedman, arguing against the majority opinion, has gone so far as to lay the burden of proof on the believers. According to Friedman, the external benefits of education result primarily from elementary and high school education; most benefits of higher education accrue strictly to those who undertake the additional training. Until the supporters of the externality argument can provide a quantitative estimate of these benefits, says Friedman (1968, pp. 108-112), "the demand for subsidy in the 'public interest' must be regarded as special pleading pure and simple.[6]

If there are external benefits from higher education, might there also be external costs? Until recently, this question would rarely have been asked, but campus unrest and market conditions facing college graduates have caused many people to consider the possibility. According to Eckaus, El Safty, and Norman (1974):

> There are countries in the world in which the phenomenon of the educated unemployed creates major social problems. The problem is not just that the incomes of such persons are low. Their ambitions, created in part by their education, are frustrated. Such persons sometimes become a threat to the stability of the society—which may or may not be regarded as desirable, depending on one's point of view. Or the educated unemployed may become an interest group obtaining special favors from the government to the disadvantage of other groups in society. The phenomenon of the educated unemployed has been thought to be a social disease restricted to less-developed countries. But just a little recession, like that of 1969-70, is enough to induce descriptions of the United States in which the employment problems of college graduates sound much like those of B.A. graduates in Bombay.

Evidently we should be wary of arguments proclaiming that the more education society purchases, the better off it is. Beyond a point, the opposite may be true.

We are willing to admit that higher education produces external benefits and even that the net external benefits are substantial. However, the relevant question for the purpose of this study is: Do graduate and undergraduate education produce the same or different quantities of external benefits? We have no sure answer to this question. According to Winkler (1973):

> . . . marginal attitude changes and, hence, social benefits of education are likely to be decreasing functions of the number of years of education obtained by the individual. In other words, we believe it is unlikely that graduate education results in many social benefits in the form of changing values and attitudes.

Winkler further notes that:

> . . . the marginal attitude change and hence social benefits of a given year of education decrease with the income level of the recipient of that education.

Based solely upon consideration of external benefits, he concludes:

> . . . subsidies to low-income students should be increased; subsidies to graduate students should be decreased.[6]

Winkler's study is a careful, well-done piece of analysis. It is, perhaps, the best analysis of the external benefits of higher education to date. However, neither his data nor his conclusion are wholly unimpeachable. In any case, we shall leave the determination of external benefits to others, simply assume that the quantities of external benefits produced by graduate education are no greater than those produced by undergraduate education, and concentrate on the monetary returns from college.

Rates Of Return On Investment In Higher Education: A Review Of The Literature

The first estimates of rates of return on college education were presented by Becker (1960, 1964) circa 1960. Using 1940 and 1950 Census data, Becker calculated rates of return on undergraduate education for 1939 and 1949 cohorts of wage earners. The estimated private rates of return for urban, native-white males were 14.5% in 1939 and 13% in 1949; the social rates were 13% in 1939 and 12.5% in 1949. These figures include an adjustment for secular growth of real earnings, but do not take possible ability differences between high school and college graduates into consideration.[7] If ability corrections are made, Becker maintains, the rates of return on education per se would be 90% of what the unadjusted figures indicate.

Since 1960 several authors have used more recent data to calculate educational rates of return that, for the most part, confirm Becker's findings. Nearly every study agrees that the private rate of return on investment in undergraduate education is greater than the 7% after-tax return on corporate capital in the U.S. (Becker, 1964, p. 115). College education, at least for those who eventually receive their baccalaureates, appears to be a good investment. And when we compare its social rate of return with the 8-12% rate of return on all business capital (Becker, 1964, p. 120) undergraduate education proves to be a good social investment. Even if undergraduate education produces no nonmonetary benefits, public subsidization of undergraduates would probably be an efficient use of society's resources.

Can the same be said for graduate training? That is, does public subsidization of graduate students constitute an efficient use of society's resources? To answer this question we turn to the literature on graduate rates of return.

In one of the first studies of returns to graduate education, Hunt (1963) found private rates of return on doctorates and Master's degrees of 3.2% and 0.6%.[8] Although this indicates that monetary returns to graduate education may not be as great as we once believed, Hunt's results are unreliable because of his small sample size.

Rogers (1969), using data that allowed him to distinguish between the returns to education and the returns to other determinants of income, found an overall private rate of return on advanced degrees of 6%.[9] Rogers' findings tend to confirm those of Hunt, that monetary returns to graduate education are small relative to both undergraduate education and other forms of investment.

Maxwell (1970), in an article provocatively entitled, "Some Evidence on Negative Returns to Graduate Education," found a negative rate of return on the Master's degree.[10] We might question whether this estimate is representative of the return to the typical Master's degree recipient, however, since his sample was atypical.[11] Maxwell also calculated a rate of return on the doctorate of 12.6%, but this figure may be unreliable for the same reason.

Dodge and Stager (1967), in a study of private and social returns to higher education in Canada, also found low rates of return on graduate education. They noted, however, that the rates of return vary significantly by discipline. The private rate of return on a doctorate in math or engineering, for example, is less than 2%, while the rates of return on doctorates in chemistry and physics are 5.6% and 7.5%. Social rates of return are much lower; whereas a doctorate in physics yields a 7.5% private rate of return, the social rate of return on this degree is only 0.7%. Similarly, the rate of return on a doctorate in engineering falls from 1.5% to -3.5% when all social costs are included in the calculation.

The 1960 Census provided the data for at least three studies of graduate rates of return. In the first of these, Hanoch (1967) calculated a 7% rate of return on graduate education.[12] Later, Ashenfelter and Mooney (1969) used Hanoch's age-earnings profiles, together with data on Woodrow Wilson Fellows, to calculate rates of return of 8.8% to Ph.D. recipients and 6.5% to Master's degree recipients. Their Ph.D. rate of return estimate indicates that graduate education may be a good investment after all.[13] Eckaus (1973), however, found a rate of return on graduate education of only 5% when he used the basic census data.

Recently, Taubman and Wales (1973) summarized the findings of an NBER study on the earnings of college graduates. Like many preceding studies, they reported relatively low rates of return on graduate education. The before-tax rates of return to Ph.D. and Master's degree recipients were 4% and 8%.

Finally, there are three studies whose results point out the pitfalls of comparing estimates of different authors. In one of these, Bailey and Schotta (1972) estimated the rates of return on education of academicians, using American Association of University Professors salary patterns for their data. They concluded that the most likely private rate of return is 0.8%. This average rate, however, hides a great deal of variation in rates, due both to different salary patterns and to different lengths of time spent in graduate school. For example, the "most likely" private rate of return to academicians in the highest-paying universities is 11.6%, not 0.8%. Furthermore, if these academicians spent only 3 years in graduate school, rather than the assumed 4 years, their rate of return is 14.7%. The place of employment and length of time to degree obviously have significant effects on the rates of return.

In the second study, Siegfried (1971) estimated the rate of return on a Ph.D. in economics. Like Bailey and Schotta, Siegfried examined the sensitivity of the rates to different assumptions about length of time spent in graduate school and about place of employment. Siegfried, however, estimated returns to persons employed by governments and businesses as well as an academicians, and he found that rates differ significantly across occupations. For example, a person who might expect to receive a 4.5% rate of return as an academician could expect a 16.6% rate as a businessman, but negative returns as a government worker. If that same person had spent one less year in graduate school, his rate of return would be 10.2% as an academician and 25.9% as a businessman. Again, the assumptions one makes about the length of time spent in graduate school and the postdoctoral employment are crucial to one's results.

Finally, Weiss (1971) used National Academy of Science data to calculate rates of return to Ph.D. recipients in various disciplines. Weiss's study, like those of Siegfried and Bailey and Schotta, shows the sensitivity of rates of return to different time-to-degree assumptions. A person with a Ph.D. in physics, for example, could expect to receive a 13% rate of return on his investment if he stayed in graduate school for 3.5 years. If, on the other hand, that person stayed in school for the average registered time (over 5 years), the expected rate falls to 6.7%. But Weiss's results also show the effects of different foregone-earnings assumptions on the rates of return. In one set of calculations, Weiss assumed that a student earned at least 39% (and in the case of mathematicians 64%) of what nonstudents of that age earned. If we compare these estimates with those that assume zero student earnings, we can see the important role student earnings plays. The average person in Weiss's sample receives a 6.7% rate of return on his investment if he has no earnings while in school, but a 12.3% rate of return if he has the earnings Weiss assumed. The foregone-earnings assumption, then, seems to be as crucial as the time-to-degree assumption.

As the reader may suspect, the literature on rates of return permit us to make few generalizations. Although most of the studies in this survey found relatively low rates of return on graduate education, more realistic assumptions about student earnings and length of time spent in school may have produced relatively high rates. In most cases, it is difficult to tell what assumptions were made; so the results of different studies are, strictly speaking, incomparable. Even so, one general conclusion emerges: Those studies that calculated rates of return on both graduate and undergraduate education found that the undergraduate rate exceeded the graduate rate, and usually by a considerable amount. Table 1 illustrates this.

Table 1
UNDERGRADUATE AND GRADUATE RATES OF RETURN

Study	Undergraduate Rate	Graduate Rate
Rogers*	14-15%	5-6%
Hanoch*	9.6%	7%
Eckaus*	13%	5%
Taubman and Wales	8%	2%
Bailey and Schotta	8%	0-1

*The rates of Rogers, Hanoch, and Eckaus are private rates of return: the others are social rates of return.

RETURN ON INVESTMENT

If the differences depicted in this table are accurate, it appears that the State is inefficiently allocating resources between graduate and undergraduate training. Nevertheless, we feel the wide variation in estimates of graduate rates of return and the riskiness involved in comparing different estimates make even this conclusion too tenuous for policy recommendations. Furthermore, these rates may not be representative of what California's students receive. For these reasons, we have estimated our own rates or return, using California cost and earnings data. The next section presents these estimates and provides a discussion of the assumptions we made in calculating them.

Rates of Return on Higher Education in California

This section presents estimates of the private and social rates of return on investment in undergraduate and graduate training in California. Private rates are based on the educational costs (including foregone earnings) the student pays and the increased earnings the degree recipient obtains; social rates are based on the full education costs, including those the student does not pay. The private rate of return is an estimate of what the average white male who *graduated* from a California public university after 1969 can expect to receive on his investment in education. The word "graduated" is emphasized since we excluded college dropouts from our analysis. Neither the 1970 Census, which provided the data on earnings of high school and college graduates, nor other sources had adequate information to estimate rates of return for dropouts from California schools. The reader should keep in mind that we did not hold ability and other factors constant and that the rates account for monetary returns only; the so-called external benefits and consumption benefits associated with schooling are ignored.

The basic earnings data used for estimating rates of return on undergraduate education came from the *Public Use Sample of the U.S. Census of Population for 1970—California*. Cost data were provided by the State Department of Finance and the State Scholarship and Loan Commission.

The financial return to investment in college would be easy to measure if all the persons in our sample were alike in every way but the amount of education they possessed. Persons differ, however, in ability, motivation, family connections, sex, race, and many other factors that might affect one's earning capacity. Although it is impossible to fully adjust our data for such differences, we did attempt to obtain a relatively homogeneous group by including only white male urbanites in our sample. Admittedly, the rates of return presented here are only approximations; but we feel they provide a good indication of the financial benefits the average graduate of California's public universities receives from his investment in education. Our estimates of the returns to baccalaureate recipients appear in Table 2.

Table 2

PRIVATE AND SOCIAL RATES OF RETURN ON UNDERGRADUATE EDUCATION IN CALIFORNIA

	Unadjusted Rate	Growth-Adjusted Rate*
Private	10.4%	11.9%
Social	8.8%	10.3%

*The adjusted rate accounts for secular growth in real earnings at a rate of 1.5% per year.

Table 3

PRIVATE RATES OF RETURN TO UNIVERSITY OF CALIFORNIA DOCTORATE RECIPIENTS

Length of Time in Graduate School	Place of Employment	Private Rate of Return	Social Rate of Return
3 years	Com. Colleges	2.6%	0%
4 years		Negative	Negative
5 years		Negative	Negative
3 years	CSUC*	7.5%	3.7%
4 years		3.5%	1.5%
5 years		1.5%	Negative
3 years	UC**	21.6%	12.9%
4 years		13.5%	8.9%
5 years		9.8%	5.7%

*California State University and Colleges
**University of California

Table 2 tells us that the 1972 cohort of college graduates can expect to receive a 10.4% rate of return on their educational investment—even without secular growth in real earnings. But growth in real earnings over time enables persons graduating from college in a given year to earn more at each age than persons who graduated earlier.[14] Assuming that high school and college graduates will experience a secular rate of growth in real earnings of 1.5% per year, the private rate of return to the 1972 cohort of college graduates is 11.9%.[15]

It is apparent from Table 2 that the typical graduate of a California public university earns a substantial return on his investment. But it is also apparent that undergraduate education is a profitable investment for the California taxpayers. The 10.3% social rate of return compares favorably with the 8-12% before-tax rate of return U.S. businesses reportedly receive on their capital investments (Becker, 1964, p. 120). These rates tend to support what other studies have found: There is a big payoff to the student and to society from college education (at least at the undergraduate level).

Graduate Education. Our rates of return on graduate education are based on (a) the 1972-73 faculty salary schedules at public colleges and universities in California, and (b) assumed faculty promotional patterns. These estimates appear in Table 3.

The first column in Table 3 lists the length of time the Ph.D. recipient spends in graduate school, the second column lists his place of employment, and the third column lists his expected rate of return; column four lists the return to society from that person's education. If, for example, the UC Ph.D. recipient spent 3 years in graduate school before accepting a faculty appointment at a CSUC campus, his expected rate of return is 7.5% and society's expected rate of return is 3.7%.

In looking at Table 3, one is immediately struck by the low rates of return to faculty members at the community colleges and at CSUC. Rates this low make us wonder why so many persons are entering California's graduate schools. One possible reason for this seemingly odd behavior is that academic life provides nonmonetary benefits *to the degree recipients.* Persons who obtain doctorates may value the academic life-style so highly they are willing to accept a low monetary rate of return. On the other hand, many graduate students may be ignorant of market factors or of their own prospects for receiving a high-paying job. At the time these persons entered graduate school, their decision may have seemed a wise one; it is, after all, the *expected* rate of return and the *perceived* riskiness of this investment that affect a person's decision to enter graduate school. If the investment turns out to be a bad one, we can only say that the investor was wrong in his expectations.

Tables 2 and 3 indicate that the private returns from college exceed the social returns for both graduate and undergraduate education. The reason, of course, is that California students typically pay only a small percentage of the total *direct* costs of their education.[16] Notice, however, that the differences between *graduate* private and social rates of return are proportionately greater than the differences between *undergraduate* private and social rates of return. Whereas the private rate of return on undergraduate education is 15% greater than the social rate, this difference is 50-100% for many graduate rates of return. This is due to the different cost burdens placed on graduate and undergraduate students. According to our data on college costs, the average undergraduate pays 13.8% of the direct costs of his education, but the average graduate student pays only 5.1% of his first-year direct costs and a mere 2.8% of his third-year direct costs. If the average graduate student were made to pay 13.8% of his direct costs, as the average undergraduate is now forced to, the private rate of return on graduate education would undoubtedly be more in line with the social rate.[17]

The implications of this finding are clear: If the State's higher education policy is to admit all qualified students, the expected social rate of return on undergraduate training will be approximately the same as the private rate of return; and since we can expect persons to enroll in college only if they believe their returns will be substantial, the "student choice" principle is likely to result in a high social return from undergraduate education. If, however, the same "student choice" principle is applied to graduate education, it is quite likely that a good investment choice on the part of the student would lead to an unacceptably low social rate of return. For example, suppose the average graduate student at UC spends five years in graduate school before accepting a faculty appointment at a UC-type institution. We might anticipate that the expected 9.8% private rate of return (Table 3) would induce many persons to enter graduate school. For each successful student, however, the social rate of return would be only 5.7%, which is significantly lower than the yield on other public investments—including undergraduate training.

On the basis of these findings, we conclude that whereas the State's goals of "free access" and efficiency might be compatible for undergraduate training, they are incompatible where graduate training is concerned.[18]

Social Returns From Higher Education

Although we have been considering the social rate of return as a guide in determining the efficient allocation of public funds, a better guide for determining where public resources should be spent is the "net present value" criterion. According to this criterion, a public agency should always choose the social investment that has the highest net present value. Where alternative social investments are mutually exclusive or where they are interdependent (as graduate and undergraduate education might be), it is possible that the net benefit criterion will produce conclusions contrary to those generated by the internal-rate-of-return criterion.[19] To determine whether our conclusion about the profitability of graduate education relative to undergraduate education would differ if we used the net-present-value criterion rather than the internal-rate-of-return criterion, we calculated the net present value (at discount rates of 5 and 10%) for both social investments. Our results appear in Table 4.

Table 4

NET PRESENT VALUE OF HIGHER EDUCATION IN CALIFORNIA

Discount Rate	Undergraduate Net Present Value	Graduate Net Present Value
5%	$48,529	$38,465 (3 years) $14,031 (4 years)
10%	$1,873	-$1,586 (3 years) -$19,430 (4 years)

*We have assumed that 50% of UC Ph.D. recipients obtain faculty appointments at UC-type institutions and the other 50% obtain appointments at CSUC-type institutions. This may be an optimistic assumption, but we have some data that indicates it might be true for graduates from UC Berkeley. We have also assumed that UC graduates spend either three or four years in graduate school before accepting [illegible] positions paying salaries commanded by Ph.D.'s.

Table 4 tells us that the net present worth (discounted future benefits minus discounted future costs) of producing one baccalaureate as $48,259 when the discount rate is 5%. This means that the present worth of producing one baccalaureate at UC is $48,529 greater than the present worth of an investment (of equal cost) yielding a 5% rate of return. Notice that the present value to society of producing one doctorate at UC is some $10,000 less, even under the most optimistic assumption (i.e., that the graduate student spends only 3 years in school); when the graduate student spends 4 years in school (probably a more reasonable assumption), the present value to society of producing one doctorate is only $14,031. Undergraduate education is obviously the more profitable social investment when the social rate of discount is 5%.

The same conclusion holds true when the social rate of discount is 10%. In this case, investment in undergraduate education will produce $1,837 more in present benefits than an investment yielding a 10% rate of return. Graduate education, on the other hand, has a negative present worth, indicating that graduate education does not pay off if the public demands a 10% return on its social investments. Clearly, the present-value criterion leads us to the same conclusion as the internal-rate-of-return criterion: The financial returns to society from baccalaureate production at UC exceed the returns from Ph.D production at UC.

Because of the optimistic nature of our assumptions about graduate earnings, time to degree, etc., we feel that our results are fairly conclusive. Our primary assumptions were the following:

1. Students enter graduate school at age 22 and are employed at the salary level of a Ph.D. by age 26;
2. The age-earnings profiles of baccalaureate holders are based on the faculty member. Use of true cohort data for undergraduates would probably lower the graduate rates of return;[20]
3. Persons who eventually enter academe after receiving their doctorates find jobs with comparable salaries after three or four years in graduate school. Although this may be true, if these persons create any costs for the University after they leave graduate school (as they would if they sought dissertation advice, for example), then the social rates of return would fall from their estimated levels;
4. *Each* year of their working lives, all UC faculty members receive additional annual earnings equal to 16% of their 9-month academic salaries.[21] If the bulk of these additional earnings normally comes

after the faculty member has established himself as a competent researcher (say after three to six years), then the rates of return are overestimated. On the other hand, we assume zero additional earnings for the average CSUC faculty member. Whether this counterbalances the effect of the assumption about UC earnings we cannot determine;

5. Half of UC's graduates receive jobs with organizations paying salaries comparable to those at UC (including the additional 16%) and half receive jobs with organizations paying salaries comparable to those at CSUC; and
6. The demand conditions facing baccalaureates and Ph.D. holders will remain fairly steady over time. In view of the recent predictions of a future Ph.D. surplus, this may indeed be optimistic. If earnings of baccalaureate holders increase at a faster pace than do earnings of Ph.D. holders, then we have overestimated the returns to graduate education.

Our conclusion that California is currently producing too many Ph.D.'s relative to baccalaureates must be tempered with some caveats. First of all, we have estimated the rate of return to Ph.D. recipients who enter academe; the rate of return to persons who enter other occupations has not been considered. Since about 60% of all UC Ph.D. recipients enter academic occupations, however, the rates probably apply to the majority of UC graduates (National Research Council, 1968).

Second, it is important to realize that these results do not apply to the average person who enters college, but only to the student who eventually receives a degree. Many persons who enter school drop out and never receive their degrees; we have no idea what rate of return these persons receive on their investment in education. Furthermore, the rates do not apply to *each* degree recipient, but only represent an *average* of what graduates receive. A person with a degree in the humanities, for example, is likely to have a much lower rate of return than a person with a degree in the physical sciences.

To get an idea of the possible variation in graduate social rates of return across disciplines, we used 1970 Census data to construct age-earnings profiles of persons with six or more years of college who are employed in various occupations. The estimated social rates of return for lawyers, physicians, engineers, high school teachers, and college teachers appear in Table 5.[22]

After the discrepancy between the social and private rates of return to physicians of better than two to one, perhaps the most striking aspect of Table 5 is the wide variation among the rates. College teachers in the arts and humanities, for example, have a highly negative social rate of return, whereas college teachers in the natural sciences have a 7.3% social rate of return. But Table 5 also demonstrates the influence of market factors on rates of return. According to 1969 earnings data, the social rate of return from training lawyers and judges is 13.4%. Since the private rate of return on a law degree is greater than 20%, it should be no wonder that demand for places in law school has increased so dramatically in the last 5 years. If we were to examine earnings of lawyers and judges today, we would probably find that the increased supply of persons in those professions has resulted in a lower rate of return on law degrees. If this were the case, the rate of return based on 1969 earnings would not even be a good indication of what 1970 law school graduates are presently receiving.

Table 5

SOCIAL AND SELECTED PRIVATE RATES OF RETURN ON GRADUATE TRAINING, SELECTED OCCUPATIONS

Occupation	Social Rate of Return	Private Rate of Return
High School Teacher	Negative	
Engineer	9.0%	
Physician	8.5%	17.1
Judges & Lawyers	13.4%	20.7
College Teachers:		
Natural Sciences	7.3%	
Social Sciences	5.0%	
Arts and Humanities	Negative	
Other	Negative	

We recognize that the same criticism (i.e., datedness) might be made of all our rates of return, and that our results are tentative and require frequent updating. Recent and more accurate data is necessary to insure that our policies correctly reflect market conditions. We therefore recommend that the University of California, the California State University and Colleges, and the Community Colleges collect information on the occupational placement of their graduates (including earnings data), cost of education students at different levels, length of time to degree for both undergraduates and graduates, and length of time students spend in school before accepting the jobs for which college presumably prepares them.

We further recommend that such information be made freely available to all potential students to help them decide whether the expected returns (and their variability) from higher education make college a worthwhile investment. Many high school graduates are aware of only the *average* returns on college education; few realize that their own chances for success may be quite small. Our recommendation, then, suggests that institutions of higher education practice "truth-in-advertising."

The next section attempts to determine the applicability of our results to present and future college students by reviewing the recent literature on manpower projections.

Manpower Forecasts

There has been growing concern in recent years that the nation's graduate schools are producing too many Ph.D's. Persons who voice these concerns note that the number of job openings in occupations which Ph.D. recipients traditionally enter is growing at a slower pace than is the number of doctorates awarded. Unless corrective actions are taken, many new graduates will be forced to enter nontraditional occupations and perhaps take jobs that do not fully utilize their talents. Although it is unlikely that many Ph.D. recipients will be unemployed, underemployment and the attending personal disappointments will be a problem.[23]

Are these concerns justified? They are, if recent supply and demand projections prove to be accurate. According to many forecasters (Cartter, 1966, 1971; National Science Foundation, 1971; Wolfle & Kidd, 1971), the academic labor market for Ph.D. recipients is already glutted and will probably get worse. Since about half of the nation's doctorate recipients have traditionally entered academe, many graduates during the 1970's will have to seek nontraditional employment. The problem is not a minor one, as Cartter (1971, p. 137) has noted:

> Even if all junior colleges were converted to 4-year colleges, every high school graduate went to college, and every new college teacher hired in the future possessed the Ph.D., by 1980 a smaller percentage of doctoral degree recipients would be

> likely to find academic positions than has been true for the preceding 25 years.

Unless nonacademic sectors can provide "meaningful" jobs, many future doctorate recipients are likely to be disappointed with the jobs they obtain.

Will the nonacademic sectors provide satisfactory jobs for the graduates who are turned away from academic life? Cartter (1971, p. 138) is pessimistic on this count.

> If my projections of academic needs are even approximately correct, and if the projected growth of doctoral degrees follows the path that I—and NSF 1971 version—believe it will, then to employ the anticipated number of new Ph.D.'s would require a better than 9 percent annual growth rate (compounded) in nonacademic employment. Except for brief periods of time, and for some subspecialities, we have never experienced such an overall growth rate for doctoral scientists and engineers in the past. My personal belief is that we are on a course, which would result in about one-third too many Ph.D.'s produced in the latter part of this decade and perhaps one-half too many in the 1980's, *for the types of employment we have known in the past*. Included in the familiar type of employment is a continued (in fact, more rapid) upgrading of the quality of college and university faculties and an upgrading of the quality of nonacademic R&D staff, as we have experienced it over the last 15 years.

Cartter's views are echoed by the National Science Foundation, which predicts that scientists and engineers will find traditional R&D positions in short supply during the present decade. Whereas in 1969 about three-fourths of the doctoral scientists and engineers in nonacademic jobs engaged in research and development, only about half of the scientists and engineers with doctorates will obtain such jobs during the 1970's. And undoubtedly the nonacademic job situation will be worse for persons with degrees in other disciplines.

How will California's graduates fare in the coming two decades? To answer this question we applied Cartter's forecast model to the California academic market. The forecast model we used to predict California's need for faculty during the period, 1974-75 to 1990-91, has four basic components:

1. A projection of future enrollment in California's public institutions and an assumption concerning the share of total California enrollments held by nonpublic colleges and universities in the state. Since the latter is somewhat uncertain, we used three alternative assumptions about the independents' share of total enrollments: (a) it would remain constant at 12% ; (b) it would initially decrease from 12% to 10% and then remain at that level for the rest of the forecast period; and (c) it would decrease steadily from 12% in 1974-75 to 8.1% in 1990-91.
2. An assumption about the student-faculty ratio at each segment. We made two alternative assumptions: (a) the student-faculty ratios would remain at their 1972-73 levels during the forecast period; and (b) the student faculty ratios would decline to specific target values.
3. An assumption about the net faculty turnover rate at each segment; and
4. An assumption about the percentage of each segment's faculty with the doctorate. We again made two alternative assumptions: (a) the percentage of the faculty with the doctorate would remain at its 1972-73 level; and (b) the percentage of the faculty with the doctorate would increase from its 1972-73 level to some target level.

Because our estimates of future faculty demand are sensitive to the assumptions about the independent's share of enrollments, the student-faculty ratio, and the percentage of the faculty with the doctorate, we made three sets of predictions:

Optimistic estimates: These are based on a declining student-faculty ratio, an increasing percentage of the faculty with the doctorate, and a constant share of enrollments for independent colleges.

Conservative estimates: These are based on a constant student-faculty ratio, a constant percentage of the faculty with the doctorate, and a declining share of enrollments for independent colleges.

Likely estimates: These are based on a constant student-faculty ratio, an increasing percentage of the faculty with the doctorate, and an initially declining share of enrollments for independent colleges. This is the set of estimates we regard as most likely to occur during the next two decades.

Table 6 presents our predictions of the number of new faculty members *with the doctorate* needed at California colleges and universities to meet expanding enrollments and to replace faculty members who die, retire, or resign. During the years in which enrollments are expected to decline (1981-1986), expansion demand will be negative; but replacement demand is always sufficient to require a positive number of new faculty members in each year.

How many of these job openings will be filled by persons receiving doctoral degrees from California universities during the next two decades? Though we cannot answer this question decisively, we can get some idea of the total by assuming that the origin of new hires remains about the same as in past years. This means that approximately 18% of the new

Table 6

CALIFORNIA FACULTY REQUIREMENTS*
1974-75 to 1990-91

Academic Year	Conservative	Likely	Optimistic
1974-75	1,860	2,466	2,977
1975-76	1,514	2,223	2,785
1976-77	1,318	2,014	2,759
1977-78	1,363	2,121	2,888
1978-79	1,458	2,295	3,222
1979-80	1,304	2,134	3,257
1980-81	1,291	2,182	3,457
1981-82	1,203	1,813	2,310
1982-83	979	1,699	2,064
1983-84	886	1,530	1,862
1984-85	668	1,221	1,498
1985-86	564	1,150	1,359
1986-87	551	1,131	1,364
1987-88	758	1,450	1,736
1988-89	999	1,886	2,138
1989-90	1,230	2,035	2,559
1990-91	1,060	1,840	2,322
Total	19,006	31,190	40,557

*Full-Time Instructional Faculty (excluding administrative deans) with doctorates. The figures exclude faculty requirements for medical schools.

Table 7

JOB OPENINGS FOR CALIFORNIA'S GRADUATE STUDENTS 1974-75 to 1990-91

Academic Year	Conservative	Likely	Optimistic
1974-75	338	449	547
1975-76	277	409	511
1976-77	235	366	509
1977-73	249	393	541
1978-79	264	424	603
1979-80	240	395	613
1980-81	237	404	656
1981-82	221	337	434
1982-83	182	314	386
1983-84	166	286	351
1984-85	126	229	285
1985-86	107	217	260
1986-87	103	210	259
1987-88	140	270	325
1988-89	183	348	398
1989-90	226	373	464
1990-91	195	341	433
Total	3,489	5,766	7,576

Table 8

JOB OPENINGS (EXCLUDING COMMUNITY COLLEGE POSITIONS) FOR CALIFORNIA'S GRADUATE STUDENTS 1974-75 to 1990-91

Academic Year	Conservative	Likely	Optimistic
1974-75	314	395	479
1975-76	249	339	441
1976-77	211	306	435
1977-78	225	327	459
1978-79	238	352	511
1979-80	218	328	519
1980-81	217	340	564
1981-82	203	269	352
1982-83	166	248	308
1983-84	154	228	283
1984-85	118	181	228
1985-86	97	155	196
1986-87	89	146	181
1987-88	118	186	225
1988-89	159	238	290
1989-90	202	297	350
1990-91	183	275	355
Total	3,161	4,610	6,176

faculty hires between 1974 and 1990 will come from California's graduate schools.[24] Table 7 lists the estimated number of California's future graduate students who will obtain faculty appointments at California schools.

Will the number of academic jobs in the next two decades be sufficient to satisfy most of the persons who are seeking such positions? If California universities continue to grant 3,500 Ph.D.'s per year (the approximate 1972-73 total), we estimate that each year there will be 612 graduates of California schools seeking the available positions.[25] Under our optimistic set of assumptions, then, it would appear that through 1980-81 the academic demand for and supply of Ph.D.'s will approximately balance (see Table 7). In 1974-75, for example, 547 of the 612 (or about 90%) of the job seekers will obtain their desired positions. After enrollments begin to decline in 1980-81, however, Table 7 indicates that an increasing number of Ph.D. recipients will be unable to find the California faculty positions they seek. Between 1981-82 and 1990-91, only 58% of California's Ph.D. recipients who look for faculty positions in California will obtain such positions.

We must emphasize that these results are contingent upon a number of optimistic predictions coming true. First, the 612 job seekers per year is based on our assumption that California continues to produce the same number of Ph.D.'s as it did in 1972-73. Since other forecasters have predicted increasing Ph.D. output from the nation's schools, it is unlikely that this condition will be met. Second, we have assumed that 18% of the job vacancies at California's colleges and universities will be filled by new graduates of California schools. If the rest of the nation is experiencing the same excess supply of Ph.D.'s and if market conditions in other occupations are just as tight, we might expect an increase in competition for the teaching vacancies and a consequent decline in the percentage of California graduate students hired.

Third, many of the job openings shown in Table 7 are at community colleges. As we saw in the last section, the pecuniary returns to Ph.D. recipients who accept faculty appointments at community colleges are very low. We might hesitate, therefore, to include these among the faculty positions being sought by California's Ph.D. recipients.

Table 8 provides estimates of the faculty positions available to California's future graduates when community college positions are excluded from the total. Notice that the total number of "desirable" faculty positions between 1974-75 and 1990-91 is 20% below the total in Table 7.

Finally, we have used our "optimistic" forecasts of faculty positions, which are based on a declining student-faculty ratio, to analyze the future academic market. Since a declining student-faculty ratio would require a substantial increase in State support of higher education, and since this is unlikely to occur in the near future, there is a high probability that these forecasts will prove incorrect. Based on more realistic assumptions about public and private funding of higher education (i.e., the assumptions underlying our "likely" predictions), we can see that at most three-fourths, and often less than half, of California's graduates in a given year will obtain the academic positions they desire. Our "likely" forecasts indicate that between 1974-75 and 1990-91 only 55% (5,766 of 10,400) of the job seekers will obtain faculty positions. Clearly, many California graduate students will have to look for jobs elsewhere.

It is possible that persons who cannot find teaching jobs in California will be able to find them in other states. However, this is very unlikely; the nationwide projections of Cartter and others indicate that the academic job market throughout the U.S. will be just as tight as the market in California. This means that only about half of California's Ph.D recipients desiring to enter teaching *anywhere* in the U.S. will be able to do so. If the other 50% cannot find satisfactory jobs in nonacademic sectors, underemployment of California's Ph.D. recipients will be a problem in the 1970's and 1980's. And if Cartter is correct, the nonacademic jobs that satisfy the aspiration of graduate students will not be forthcoming.

The implications of the manpower forecasts for our analysis of financial returns to higher education are obvious. Not only are we currently producing too many doctorates relative to baccalaureates, but unless some changes are made, voluntarily or otherwise, this situation will be exacerbated by future events. Since the financial payoff from graduate education is likely to fall during the next two decades, we may expect the difference between social returns from graduate and undergraduate education to widen.[28] On this basis, it appears that a reallocation of public resources from graduate education to undergraduate education would result in a more efficient use of public resources. If the demand for specialized skills is declining, the current level of graduate training cannot be justified. We therefore recommend that the State of California employ budgetary rewards and sanctions to encourage the University of California to give greater attention to market factors in setting graduate enrollment levels. We hope that such a system will improve the current situation and prevent future imbalances from occurring.

We should point out that our recommendation that market factors be instrumental in determining graduate places is not novel. In fact, in 1958 the University of California (Liaison Committee of the Regents, 1958) itself argued that the State should:

> Provide adequate funds for at least doubling the total capacity for producing doctor's degree holders in this State. Note should be taken of the relationship of supply and demand in the various subject fields as a basis for planning expansion in given departments and institutions.

While it is apparent that market conditions in 1974 do not merit doubling the University's capacity to produce Ph.D.'s, the basic principle is the same: Market factors should play a role in determining educational support.

Nor is a market-oriented budgeting procedure a radical change in State policy. It is currently State policy to admit only those students who are "good risks," i.e., those with a reasonable chance of graduating. Since what constitutes a "good risk" depends on the social payoff from educating a particular student, the State has always implicitly considered market factors. We are simply proposing that the State be more explicit in its concern about the financial returns from education.

In making these recommendations, we should also point out that the State will eventually be forced to deal with the problem of Ph.D. overproduction; and it is better to meet the issue now than later. For, if the aspirations of a large number of educated persons are defeated by labor market conditions, we might very well see a powerful lobby bidding the government to create "meaningful" jobs for underemployed doctorate holders. Already there have been suggestions (e.g., Hansen, 1970, p. 124) that the Federal Government establish a WPA program for Ph.D.'s:

> Essentially, a political case for reducing unemployment will have to be made if the other national objectives are to be achieved. Such a case cannot be made by merely pointing to 40,000 or 50,000 or even 100,000 unemployed doctoral degree holders; the number is too small among five million unemployed. The case should be that the expense of producing Ph.D.'s makes them a national investment. The manpower is too valuable and the social needs too pressing to allow Ph.D.'s to waste their talents in unsuitable positions. (Harvey, 1972, pp. 13,71)

A better policy, we maintain, would be reliance on market factors in deciding how many graduate degrees to produce. We do not feel the State should be obligated to support the training of every prospective graduate student seeking admission to the University of California. Indeed, the existing oversupply of Ph.D.'s and the high cost of Ph.D. training provide adequate justification for reducing the State's commitment to graduate education. On the other hand the situation does not call for a draconian administrative solution. What we are proposing is a gradual but sure reduction in the State's commitment to Ph.D. training. Nevertheless, we believe the time to act is now, before the situation dictates a more drastic response.

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[1] Of course, the stated efficiency criterion ignores other considerations. A university's administrators might be interested, for example, in maintaining a reasonably equal distribution of education funds across disciplines; or they may allocate funds among different student levels so as to maximize the university's prestige. In either case, efficiency as we have defined it might be of secondary interest to the university's administration. This does not imply, however, that public officials should ignore efficiency in allocating State funds.

[2] The student's room and board charges are usually omitted from cost calculations because they would have been incurred even if that person were not in school.

[3] Some authors refer to the monetary benefits as "investment" benefits and to nonmonetary benefits as "consumption" or "psychic" benefits.

[4] It is, of course, possible that many nonmonetary benefits of some jobs (e.g., college teaching) are payments for productivity. In this study we will assume that productivity can be measured by salaries.

[5] An external benefit is a desirable indirect side effect of an action that confers a gain on persons without exacting payment.

[6] It should be noted here that analysis of the pecuniary costs and benefits of education supports Winkler's conclusion insofar as the desirability of increasing the representation in higher education of minorities, women, and the poor is concerned. We found that nonwhites and females receive higher rates of return on their investment at each educational level than do white males. See also Richard Freeman, "The Implications of the Changing Labor Market for Members of Minority Groups," in M. Gordon, ed. *Higher Education and the Labor Market*, New York: McGraw-Hill Book Company for the Carnegie Commission on Higher Education, 1974.

[7] If high school and college graduates have different characteristics that affect earnings capacity (for example, ability, motivation, and family connections) then failure to adjust for these differences would result in earnings due to these characteristics being attributed to education.

[8] These are his estimates for persons in business occupations. Returns to persons in other occupations are somewhat lower; the rates of return to the Ph.D. in government occupations is 1.8% and in education 1.0%. The returns to Master's degrees in these occupations are negative.

[9] When Rogers adjusts his income figures to account for ability and other differences between graduate students and undergraduate students, this rate falls to 3%.

[10] This negative rate is for male degree holders; female Master's degree holders receive a 6.3% rate of return on their investment.

[11] In Maxwell's sample, 56% of the men with Master's degrees majored in education. This compares with 31.1% of the men at the University of Nebraska, from which he drew his sample, and 27.2% of the men at all U.S. institutions. See Robert H. Wessel, "Ability and the Returns on Graduate Education," *Western Economic Journal*, June 1971, 9, pp. 208-210, for this criticism of Maxwell's study.

[12] It is difficult to interpret graduate rates of return based on Census data. The 1960 Census permitted calculation of the average earnings of persons who had completed more than four years of college. Although Ph.D. and Master's degree recipients are included in the data, so too are dropouts, persons who take longer than four years to receive their baccalaureates, and many graduate students. These rates may therefore be biased estimates of graduate rates of return.

[13] The difference between the graduate rates of return of Hanoch and those of Ashenfelter and Mooney may be due to a difference between ability levels of the two samples. Ashenfelter and Mooney admit that the average Woodrow Wilson fellow has a higher IQ than the average graduate student. Therefore, whereas Hanoch's estimate represents what an average graduate student might expect to receive, Ashenfelter and Mooney's estimate represents the return to an above-average graduate student.

[14] See Becker, *Human Capital*, p. 73 and Appendix 2 (this report) for a discussion of this issue.

[15] We are assuming that future supply and demand conditions in the labor market do not favor college graduates over high school graduates or vice versa. If high school graduates are in excess supply while college graduates are in high demand, we would expect real earnings of college graduates to rise more rapidly than real earnings of high scool graduates.

[16] By convention, direct costs include all costs of college except foregone earnings.

[17] A tuition fee of $1,050 per year (instead of $660 per year) for Stage I graduate students and a fee of $1,575 per year for Stage II graduate students—with no increase in the average grant and fellowship, including tuition waiver—would increase the percentage of direct costs borne by graduate students to 13.8%.

[18] This conclusion could be altered if the nonmonetary benefits from higher education are substantial, but only if graduate education produced higher-valued nonmonetary benefits than undergraduate education produced. Since it is likely that graduate education produces fewer nonmonetary benefits than does undergraduate education, we believe our conclusion is valid.

[19] We owe this point to Professor Leonard Merewitz of the University of California, Berkeley. For a discussion of this issue, see Leonard Merewitz and Stephen H. Sosnick, *The Budget's New Clothes*, Chicago: Markham Publishing Company, 1971, pp. 85-108.

[20] If we had used cross-section data on earnings of UC and CSUC faculty members, the rates of return would have been lowered *substantially.*

[21] A 1971 Department of Finance study of 334 full professors at UC Berkeley revealed that the average professor received additional compensation (including research funds) equal to 16% of his 9-month academic salary. Our assumption that the average faculty member receives equivalent compensation has a tremendous effect upon the estimated rates of return. Whereas the social rates of return on graduate education were 6.7, 8.9, and 12.9% (depending on length of time in school) when earnings were augmented by 16%, the corresponding rates were 3.3, 4.8, and 7.3% when we assumed no additional earnings.

[22] Because of the small sample sizes, one should view these rates with some skepticism.

[23] Of course, one may argue that using Ph.D.'s in these nontraditional jobs is desirable since the additional knowledge and ability a Ph.D. recipient brings to these jobs will certainly be good for society. While this may be true, it is unlikely that the benefits from filling these positions with Ph.D. recipients outweigh the costs. The undiscounted social cost (including foregone earnings) of producing one Ph.D. at the University of California is between $68,000 and $83,000. And, as Cartter points out, " . . . the human cost in unfulfilled expectations and discouragement may be even more important." (Allan M. Cartter, "Scientific Manpower for 1970-1985." *Science*, Vol. 172, 1971,132.

[24] See Appendix 3 of our original report for our data on origins of California Faculty members.

[25] See Appendix 3 of our original report for the derivation of this figurem

[26] We have said nothing, so far, about the future labor market for baccalaureate holders. The direction of change in the rate of return on graduate education will depend on the change in graduate earnings *relative to* undergraduate earnings. If baccalaureate holders also face poor market conditions, the rate of return on graduate education could rise despite a slower growth rate of earnings. According to the Bureau of Labor Statistics, however, market conditions for baccalaureate holders are expected to remain fairly stable. (See Bureau of Labor Statistics, *College Educated Workers, 1968-1980: A Study of Supply and Demand*, U.S. Department of Labor, Washington, D.C. 1970.)

We might point ou that Ph.D. holders who enter occupations traditionally held by baccalaureate holders are unlikely to disrupt the labor market for baccalaureates since the number of Ph.D.'s produced each year is so small relative to the number of baccalaureates produced. In 1972-73, for example, California public colleges and universities granted 66,068 baccalaureates and only 2,884 doctorates (excluding health sciences). Nationwide, only about 4% of the total degrees awarded are doctorates.

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RETURN ON INVESTMENT

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A REPORT ON THE IMPLEMENTATION OF POSTSECONDARY BUDGET REVIEW IN MINNESOTA

Robert J. Rustad and Neal M. Burns,
Minnesota Higher Education
Coordinating Commission

The Minnesota Higher Education Coordinating Commission was given budget review authority by the 1973 Minnesota Legislature. The budget review law authorized: (a) the development of a compatible program budget format for legislative reporting by all public postsecondary systems, including requests for capital improvements, which related program outputs to educational needs; (b) the review of budgetary requests; and (c) a continuous analysis of the financing of postsecondary education in Minnesota in order to relate long-range needs and the utilization of present resources.

Prior to the passage of the budget review law, the Commission had no role in postsecondary education budgeting. Each public system (Minnesota State Department of Education, Community College Board, State College Board, and University of Minnesota Board of Regents) independently prepared and presented its budget to the Governor and the Legislature. Under this arrangement, the systems were free to structure their budget format and reporting categories. As a result, system budgets were not comparable, program reporting was minimized, and the appropriations hearings centered on incremental budget requests.

Under this budgeting system, no comprehensive or systematic budgetary analysis was possible for policymaking purposes. Moreover, the different budgetary procedures implemented by each system, which tended to emphasize line item and object-of-expenditure budget categories, discouraged budget hearings focused on educational goals, needs, priorities, and programs. While this procedure complicated allocation decisions by the Governor and Legislature, it enhanced the education systems' strategic capability during the appropriations process.

The establishment of a budget review process under the direction of the Higher Education Coordinating Commission resulted from a number of political, financial, and demographic factors in Minnesota that go beyond the scope of this paper. As background, however, it should be noted that Minnesota has recently passed through a period of tremendous growth in the postsecondary educational sector. Since 1965, 20 institutions have been established and many existing campuses expanded. At the present time, the state is operating 63 postsecondary institutions through 4 separate governing systems, many of which are of marginal size and are in close geographical proximity to other public postsecondary institutions. (A comparison of public postsecondary institutions in Minnesota with the Carnegie Commission's 1974 recommendations on institutional size reveals that of the 53 two-year institutions, 47 are below the minimum enrollment level and 6 are within the acceptable range. Of the four-year comprehensive colleges, two are within the recommended enrollment range and six are below). Since 1970 overall on-campus enrollments have stabilized and are projected to decline steadily through 1990. Live births in Minnesota have decreased 36% since 1959. As a consequence, many campuses are under-enrolled and per student costs are rising at a time when state revenues are curtailed by the economic recession and the demand for state funds from other programs serving human resource development are intensifying. Together, these developments have created a strong force for more closely examining the state's investment in postsecondary education.

A related development at the national level, which has contributed to centralized budget review by state coordinating agencies, has been the pressure for increased accountability by all public agencies and which has extended into postsecondary education. As the National Commission on the Financing of Postsecondary Education in the United States (1973) has noted, "The demand for greater accountability assumes that the previous efforts of fiduciary accounting and reporting will be continued and, to the extent possible, improved." This has been the thrust of the budget review task: to provide a better information base for making major program decisions in Minnesota. In that context, the Commission has responded to the wide demand for an expanded definition of accountability in postsecondary education, which calls for:

1. Accounting for the use of resources in relationship to the achievement of specific objectives—funders may want to know how much institutions spend (including cost per student) to achieve an objective and to what extent the objective is achieved.
2. Demonstration that the resources available are used efficiently—funders want to know if the resources are being used in order to achieve maximum productivity; and
3. Evidence that institutional objectives selected reflect the needs of citizens in their roles as students, society, and funders—and it cannot be assumed that their objectives are always identical.

Postsecondary education has grown faster than many other industries or public services in our economy during the last generation (O'Neil, 1971). This rapid growth has stimulated much public and private concern about the costs of postsecondary education and how it should be financed. Yet, very little is known about the magnitude of postsecondary education costs in Minnesota and how they have changed over time. Even less is known about the number and types of programs available in postsecondary education or how they are projected to grow in the future. This undesirable situation is due in part to the lack of any commonly agreed upon measures and definitions for postsecondary educational activities. It also stems from the different accounting and recording-keeping techniques maintained at each institution. Differential administrative and educational structures that exist among postsecondary education institutions further confuse this complex situation.

Since a major goal of state government is to provide postsecondary education with a reasonable investment of tax dollars, those responsible for state policy need information which assists them to identify important policy issues, clarify educational goals, evaluate the effectiveness and efficiency of services, and develop appropriate planning procedures for responding to changing educational needs. Utilization of a program budget system for state level decision-making increases the state's ability to deal with postsecondary educational problems in a comprehensive manner and to place in better perspective the principal issues of resource allocation. While this process will not automatically yield definitive solutions to complex problems, it should provide an improved information base that is relevant to budget appropriations and policymaking.

The central purpose of program budget review in Minnesota is to integrate the planning/programming and financial management functions of postsecondary education to:

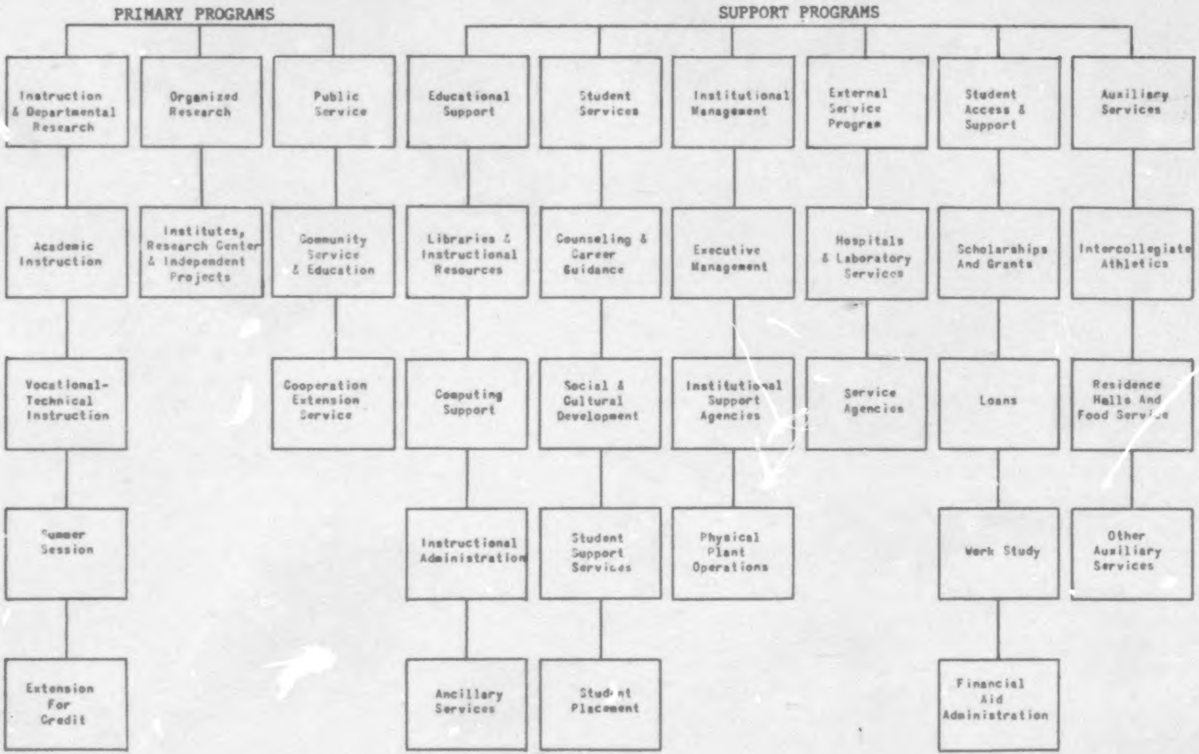
— identify and measure real educational needs
— identify broad educational and administrative objectives
— relate objectives to specific programs
— relate programs to resource requirements
— relate resource requirements to budgets

Learning about objectives and needs is one of the primary goals of this type of budgeting. It is essential that goals and needs be examined as critically as program categories or spending levels. In fact, the analysis of budget requests as they relate to educational objectives and needs may be the most important result of the budget review process. It is only against the framework of well-defined institutional mission statements that are coordinated both within and across systems that budget requests may be properly analyzed. Accordingly, one of the major aspects of the current effort is directed to the development of mission statements that specify programmatic responsibilities in the primary functional areas of instruction, research, and public service.

At the project's outset, the desirability of well-stated and documented need statements was recognized by the Commission. Such statements would serve as clear evidence of system and institutional management desire to move toward specified objectives and measurable outcomes, and also provide legislative insight concerning the rationale and importance of programmatic offerings. In short, need statements are a key element in supporting the accountability function of program budgeting. Such statements help describe the discrepancy between what *is* and what *is desired.* Properly framed need statements can describe: (a) the importance of a need to the community, state, institution and system; (b) the data which support the presumption of need; (c) the precision with which the need has been specified; (d) the program and its objectives being attained, and (e) the measures by which the system (or

Figure 1

MINNESOTA POSTSECONDARY PROGRAM BUDGET CLASSIFICATION STRUCTURE


PRIMARY PROGRAMS
SUPPORT PROGRAMS
Instruction & Departmental Research
Academic Instruction
Vocational-Technical Instruction
Summer Session
Extension For Credit
Organized Research
Institutes, Research Center & Independent Projects
Public Service
Community Service & Education
Cooperation Extension Service
Educational Support
Libraries & Instructional Resources
Computing Support
Instructional Administration
Ancillary Services
Student Services
Counseling & Career Guidance
Social & Cultural Development
Student Support Services
Student Placement
Institutional Management
Executive Management
Institutional Support Agencies
Physical Plant Operations
External Service Program
Hospitals & Laboratory Services
Service Agencies
Student Access & Support
Scholarships And Grants
Loans
Work Study
Financial Aid Administration
Auxiliary Services
Intercollegiate Athletics
Residence Halls And Food Service
Other Auxiliary Services

institution) chooses to be held accountable in determining how well they have managed their activities to meet the need.

The budgetary data developed by this process will provide, for the first time, compatible and comparable financial and non-financial information for all postsecondary education systems and begins to emphasize the relationship between educational needs and programmatic investments to the outputs of the educational process. Comparable data means that meaningful comparisons may be made although differences in the institutions may be great and although slight differences in the compilation techniques may have been utilized. With an understanding of system and institutional goals, however, comparisons of many meaningful parameters in postsecondary education can be performed and contribute substantially to an understanding of costs and results. Examination of the total investment made by the state in the postsecondary enterprise by system, campus, and program activity should enable policymakers to achieve a more consistent input to educational decision-making. Ultimately, this process will provide an opportunity for the identification of the budgetary consequences of postsecondary appropriation decisions.

Traditional line-item and object-of-expenditure budgets are relatively complex reports that reflect previously approved spending authorizations. In governmental operations such budgets usually are incremental, based on some change from the previous budgetary period. The budget normally represents the expectation, among those who have prepared it and those who will review it, that what was budgeted in the previous reporting period will be accepted this reporting period.

Program budgeting is a planning and management process which restructures customary fiscal information into categories representative of the activities that are conducted by the organizational unit. Program budgeting, then, provides a structure for *organizing information about expenditures and* outputs. The structure provides three things: (a) it arranges cost data in meaningful units; (b) it eliminates or substantially reduces overlap; and (c) it arrays budgets with regard to specific outputs and goals that can be expressed in quantifiable terms.

In reviewing its charge from the legislature, the Commission identified five primary purposes for the budget review process:

1. To integrate budgeting with the planning process.
2. To relate appropriations for postsecondary education to state policies, goals, and objectives for postsecondary education.
3. To make the budgeting process more rational.
4. To improve internal and external confidence in the budgeting process.
5. To provide an information base and descriptive terminology to legislative members and committees which make investment decisions on programs and activities better understood and more readily communicated.

The provision of financial support to postsecondary education is characterized by technical issues and policy issues. Policy issues, which are appropriately viewed as the most important aspect of the budgeting process, include such matters as the general level of support for education, increasing

Table 1

AGGREGATED INSTRUCTION ACTIVITIES

Academic Instruction

Agriculture
Architecture & Environmental Design
Biological Sciences
Business & Management
Dental Hygiene
Dentistry
Education
Engineering
Fine & Applied Arts
Foreign Languages
Forestry
Home Economics
Law
Letters
Library Science
Medical Laboratory Technology
Medicine
Military Science
Air Science
Mortuary Science
Nursing
Occupational & Physical Therapy
Pharmacy
Physical Science
Public Health
Social Sciences
Veterinary Medicine
Interdisciplinary Studies
University College
General College

Vocational-Technical Instruction

Agriculture
Business & Office Occupations
Consumer-Homemaking
Distributive Education
Health & Paramedical Occupations
Occupational Home Economics
Technical Education
Trade & Industry
Related Instruction
Special Needs
Adult Vocational Education

the access to postsecondary education and the price charged to students for educational services. Before these issues can be rationally assessed, however, the financial factors that bear on them must be thoroughly analyzed.

The Model

Because of the nominal character of program classification models and their inherent limitations with respect to the particular needs of the Minnesota budget review model, the Commission developed, on the basis of discussions with the public postsecondary systems, a classification system which draws on the Program Classification Structure (PCS) developed by the National Center for Higher Education Management Systems (NCHEMS). Some modifications have been made in the PCS in order to accommodate organizational phenomena in Minnesota. The Minnesota budget review classification model is presented in Figure 1.

There are three levels in the Minnesota program classification structure: (a) programs (those boxes that comprise the top row in Figure 1), (b) subprograms (all of the remaining boxes in Figure 1), and (c) instructional activities. The instructional activities that have been identified for reporting purposes in the program classification structure are contained in Table 1. In terms of the taxonomic structure, they represent a further subdivision of the subprograms "Academic Instruction" and "Vocational-Technical Instruction."

In an attempt to assess both financial and non-financial characteristics of a reporting unit, the following information is collected: (a) full-year equivalent students by level of instruction, (b) full-time equivalent faculty by rank, (c) certificates and degrees granted, (d) expenditures by category, and (e) source of funds. These measures are further supplemented by a "need" statement for each program which provides the rationale for each program request. The need statement also contains a brief description of the mission, history, and philosophy for each program to provide a contextual framework for evaluating the program.

As mentioned above, public postsecondary education in Minnesota is organized under four independent governing boards. In addition to reports for each system, the Commission constructed a budgetary report system which arrayed program data by campus and for all public systems. As such, the Commission can produce highly aggregated reports by organizational level or program as well as detailed reports by instructional activity and campus. The Commission budget reporting matrix is presented in Figure 2. The Commission has on-line access to the budget information which is stored on System 2000, a data base management system which has the capacity for updating the data and producing complex reports in a highly flexible format.

The development of a systematic reporting system for capital construction requests is perhaps a more technically demanding task than a program budget reporting system. Faced with a severely constrained time schedule and limited staff, the Commission limited its work in the area to the adoption of a standardized taxonomy of space types by function and the development of a reporting format. Future work will include the development of space utilization norms and the implementation of a facilities planning cycle.

Figure 2

BUDGET REPORT MATRIX

Administrative/Organizational Levels

Program	Campus	System	All Systems
Activity	Activity/ Campus	Activity/ System	Activity/ All Systems
Subprogram	Subprogram/ Campus	Subprogram/ System	Subprogram/ All Systems
Program	Program/ Campus	Program/ System	Program/ All Systems
Total	Campus Summary	System Summary	All Systems Summary

Conclusion

Traditional budget processes facilitate discussions about the determination of an overall appropriations level. All parties focus on the achievement of a negotiated budgetary figure. Program budgeting, on the other hand, tends to polarize points of view. Participants are compelled to make a choice among alternatives and substantiate their choices on the basis of a thorough understanding of the public policy issues involved. Thus, it should be anticipated that normal collegial relationships will be strained during the implementation of a program budget system. Establishment of program budgeting results in three outcomes. First, it decreases agreement among the participants. Second, it increases the burden of calculations on the participants. And, third, the decisions and outcomes that result from the process may be different.

Recent experiences in enrollment-driven formula funding and modern educational management practice have demonstrated that effective budgeting must be based on programmatic considerations, such as the type of instruction (laboratory, lecture, clinical supervision), field of study (automotive repair, social science or nursing), level of instruction, and other pertinent factors which reflect the educational activity being conducted. The determination of appropriations through the application of gross faculty-student staffing ratios is not sufficient, particularly in a period of stable enrollments and runaway inflation. As such, a more rational decision-making procedure could be applied to legislative appropriations and to the internal allocation and management of institutional budgets.

The implementation of a program budget system in any public organization is a highly technical and politically controversial task. Political resistance is encountered whenever change is introduced into a system. Established procedures and priorities are potentially threatened, comfortable relationships disturbed, and unknown outcomes posed. In many cases, new questions are raised about an enterprise and suitable explanations are requested. This is a stressful and threatening experience. On the technical side, the establishment of a program budget system represents a difficult and time-consuming exercise which requires the identification of programs and the implementation of sophisticated planning, budgeting, and management techniques. Frequently, it necessitates the conversion of existing record systems into a new format.

Presently, program budgeting is program reporting. In other words, educational expenditures and activities are converted from organizational accounting and recording into a report which is structured programmatically. A program budget system would systematically identify and organize the activities of an institution in terms of its objectives, display the costs of these activities over time, and relate activities and their costs to the outputs associated with the achievement of an institution's objectives.

Program budgeting can be viewed narrowly or broadly within the context of the decision-making process. In the constrained approach program budgeting consists of the systematic accounting of expenditures according to some program classification structure. For policymaking purposes, this approach represents a substantial improvement over traditional fiduciary budgeting and accounting. Within this particular approach to budgeting, it is possible to more easily understand the program objectives, operational style, magnitude, and array of activities occurring within a system. This approach to program budgeting provides an overview of existing programmatic activities. It is also possible to view program budgeting as a more extensive policy-oriented analytical exercise. According to this model, budgetary allocations are made in accordance with specific missions, roles, and programmatic objectives. As such, it is more closely tied to the planning and policymaking process and the data base generated may be utilized directly in the analysis and selection of alternatives. The long-range goal of the Commission's program budgeting effort is to provide an analytical framework that is of value to planning and policymaking at both the system and the legislative levels. The reality of planning in public institutions, in fact, strongly suggests that a mutually understood budgetary/planning instrument is required for effective communication between institutional and system representatives on the one hand, and legislative members and staff on the other. The current program budgeting effort represents a significant first step in that direction; future revisions and efforts will carry it further.

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THE FRUITS AND FRUSTRATIONS OF STATEWIDE COOPERATIVE RESEARCH EFFORTS

Michael O. Stewart,
Peru State College

Cooperative research efforts within a higher education system are not new. The activities in Kansas during the past three years are noteworthy because they developed as a model for institutional research. Several diverse major data collection and analyzation projects were undertaken which resulted in the publication by the Board of Regents of: (1) *Guidelines for Increasing Academic Efficiency at the State Colleges and Universities* (hereafter referred to as *Guidelines*); (2) *Physical Development Planning Manual;* (3) a *Physical Development Planning Workbook* for each campus and a long-range planning flyer for each campus (flyers were published locally); and (4) *A Review and Analysis of Undergraduate Programs at the State College and Universities.*

An evaluation of this model with its diverse components is needed to evaluate Kansas decision-making. This paper will address itself primarily to comments on the fruits and frustrations engendered by the personnel involved with this model. Some general evaluative comments will be noted also.

Background and Assumptions

The introduction to the *Guidelines* (1972) report very carefully and articulately stated the underlying philosophy, assumptions, and methodology which permeated the entire system-wide institutional research effort.

> . . . Under these circumstances the matching of available resources against society's expectations of, and demand for, public education of the highest quality requires the exercise of maximum efficiency, thoughtful planning and rational setting of priorities.
>
> No college or university can do all the things its students, faculty, alumni, and patrons would like to have it do. Each institution has to establish priorities. Moreover, in state systems, the priorities for each unit must reflect overall, system-wide priorities in keeping with the fiscal and social realities of the state. Obviously today, when social changes seem to come more rapidly than in the past and when a number of impending changes appear to relate directly to the educational system, it is essential to be ready to forge new plans to reflect changing conditions.
>
> Faced with the need to husband resources carefully and allocate them wisely, the Kansas State Board of Regents has chosen to develop close coordination and cooperation among the six units for which it is responsible through a "do-it-yourself" approach. *Believing it unwise to pour resources into a large central coordinating staff in Topeka, the Board has relied on a small professional staff working with committees of representatives from each of the six institutions to analyze needs and problems and make recommendations* [italics mine].
>
> This approach to system-wide coordination was formalized in 1969 when, with the approval of the Regents, the Presidents of the six Kansas State colleges and universities established the Council of Chief Academic Officers (COCAO), bringing into close association the six officers (one from each campus) most directly responsible for administering the academic program at each college and university. The Presidents asked this group to review the programs of the six institutions, giving special attention to the nature and extent of duplication in the offerings of colleges and universities, and to prepare specific recommendations for the development of a more efficient and effective Regents' system in Kansas. *No special funds were appropriated in support of this analysis; a rigorous self-study was conducted as part of the regular ongoing operations of the institutions* [italics mine].
>
> Certain basic assumptions underlying this approach to the problem were gradually clarified through discussions within COCAO and with the Presidents, Regents and various faculty members. Among the more important are the following:
>
> 1. . . . They [Kansans] want quality education at reasonable cost.
>
> 2. . . . The assumption that, because the state's population has not increased materially in the last 30 years, Kansans should resign themselves to stagnation and mediocrity is specifically rejected.
>
> 3. Lasting improvements in the operating efficiency and effectiveness of the Kansas colleges and universities can best be achieved by utilizing the expertise within the six institutions rather than by attempting to impose reforms developed by a large central staff or by outside consultants.
>
> 4. The achievement of effective coordination over the long run is dependent upon the establishment of a continuing process of inter-institutional program monitoring and review.
>
> 5. While unjustifiable duplication of programs should not be permitted, in some instances duplication is both necessary and desirable—and not particularly costly. (Kansas Board of Regents, 1972, p. 1-2)

Personnel—Their Fruits and Frustrations

The preceding quotation, as is often the case, does not tell the entire story. It is correct that the confederation approach was dictated and each institution was to perform the necessary data collection and analysis by taking the resources required "out of its own hide." At the inception of the project the organization and operation of the institutional research offices on the respective campuses ranged from no office or personnel to a sophisticated office with four full-time personnel working in all facets of educational research. The initiation of these projects forced one college to free a person half-time to work in institutional research with one graduate assistant. Ironically, over a three year period, this college put more resources into institutional research personnel than its sister institutions. The net result for the entire system was an increased emphasis on institutional research on each campus.

One of the important reasons for the unqualified success of most projects was the personnel involved. In any representative group a certain amount of self-interest and political "horse trading" is present. The top three representative groups in Kansas (Council of Presidents, Council of Chief Academic Officers, and Council of Business Officers) generally put self-interest ahead of objective decision-making.

However, the Institutional Research Personnel (IRP) approached their charge with a high degree of professionalism, objectivity, mutual respect, trust, and friendship. Without question this atmosphere contributed greatly to the productivity, validity, and reliability of the group's collective effort. Obviously this was a chance occurence which could not have been preplanned.

To some extent this objectivity carried over to the Long Range Physical Planning group. However, one immediate problem in this group was a lack of uniformity in positions of institutional representatives. The majority were architects but institutional researchers and other administrators also belonged to this group. Much of the data required by the *Physical Development Planning Manual* for the respective *Physical Development Planning Workbooks* involved a collection of data on semester credit hours, contact hours, credit hours, square footage, and so forth. This data was collected on each campus by one of the following offices: institutional research, planning, or architectural. This procedure could have lent itself to non-comparable data because of definitional problems. Fortunately, most of these problems were identified, but not always prior to the collection of data which resulted in duplication of effort. Real coordination on each campus was required. Both local and consulting architects did not always fully appreciate problems peculiar to higher education.

Very early in the collective discussions it was decided to make the Program Classification Structure (PCS) developed by the National Center for Higher Education Management Systems (NCHEMS) the basis for all data collection and analysis. This was a wise decision so that data would be intra- and inter-institutionally compatible. However, outside of the six institutional research offices there was great diversity in regard to knowledge of the taxonomy. The local architects did not understand the rationale behind the taxonomy and some business officers viewed any new system of common accounting as a threat which would diminish their control. Department chairmen had trouble differentiating between NCHEMS data designed for inter-institutional use and departmental data which was normally peculiar to a given organizational structure on a given campus.

The major irony in developing the institutional research model was the Board of Regents' staff had no one knowledgeable or working full time in institutional research until the design was completed for the last publication, *A Review and Analysis of Undergraduate Programs at the State Colleges and Universities*. However, the Board staff did have very capable and knowledgeable people working with the Long Range Planning Group, the Council of Business Officers, and the *ad hoc* formula budget group.

The initial 20 months of individual and collective effort culminated in December 1972 with the publication of the *Guidelines* report. Prior to publishing the report the Council of Presidents had to determine how much of the data was to be included in the final report. The report from the Council of Chief Academic Officers to the Council of Presidents included a 40-page appendix showing instructional cost data by field of study, by institution, and by student level. However, the final product showed only two tables: salary cost per student credit hour by student level; and salary cost per student credit hour by student level for selected fields of study, i.e., social sciences and engineering. Salary cost differentials proved to be potentially embarrassing especially when relatively low paid teaching assistants were used. Additional editing was performed which resulted in a more concise but a "sanitized" final publication.

Some Ramifications

The *Guidelines* report made national headlines and a synopsis in *Time* stated that 63 graduate degree programs were recommended to be discontinued. Numerous other programs were recommended to be placed in a provisional status. The figures were really much more of an analysis of *fait d' accompli* action. Through atrophy most of the programs were vestigial at best and already defunct at the worst. In essence a catalog housecleaning of degree programs was accomplished. The criteria for placement in one of these catagories was degree productivity. It was noted earlier in assumption five that duplication *per se* was not necessarily bad. However, the quantitative approach ignored qualitative judgments. The recommendation to discontinue these programs was sound. It did hurt a few programs, and it did sound a warning to many departments of the new ground rules for retaining graduate programs.

One special problem should be mentioned. In a system where campus enrollments range from 4,500 to 19,500 a strict quantitative measurement obviously places more constraints and hardships on the smaller campuses. For example, in the colleges programs are offered in the department of music in applied music and music education. In most cases, the vast majority of students pursue the music education option. Relatively small music departments were faced with a choice between a degree offering in applied music (PCS category 1004) and music education (PCS category 0832). However, a compromise was reached in the Council of Chief Academic Officers whereby all music would be recorded as applied music thereby insuring the music programs at the colleges.

The specific recommendations set forth in the *Guidelines* report established some additional tasks to be completed with concurrent timetables. The printed word came back to haunt some of the institutions which had some second thoughts about what effect the *Guidelines* report was having on their campus. The die had been cast and plans were made in the spring of 1974 to conduct a second faculty activity analysis and to prepare a "Guidelines II" report on undergraduate programs. In March 1975 *A Review and Analysis of Under-*

graduate Programs at the State Colleges and Universities was published. The newness of this publication and the author's unfamiliarity with it precludes any comments at this time.

Limitations

All concerned noted the limitations in the *Guidelines* report:

> This report should be viewed as a significant first step in a complex process. With experience, it may be expected that more sophisticated methods of analysis and evaluation, including greater emphasis upon qualitative factors, will be utilized adding weight to future recommendations. While data never before available have cooperatively been compiled as a result of this study, that data base must continue to be further refined. In any case, programs must be reviewed continuously to assure appropriate adaptation to changing conditions.
>
> Limitations of this report stem primarily from the enormous complexity of the subject, the limited time available for preparation of the report, the lack of adequate national and regional norms regarding the matters under investigation, and the fact that the Regents' responsibility and authority in state planning does not include the private, municipal, two-year or vocational technical institutions. Nevertheless, COCAO, the Council of Presidents and the Board of Regents believe it is a substantial beginning worthy of careful consideration by the Governor, the Legislature and the general citizenry of the state. [Kansas Board of Regents, 1972, p. 4]

Evaluation

Kansas was very slow in any statewide master planning effort. Many states had elaborate plans developed. Some were good and some were discarded as soon as they were completed. Those items which were difficult to quantify have, in some cases, come back to haunt higher education. Without question the problems of accountability and credibility, or lack thereof, in higher education resulted from many legitimate requests for information by boards, legislatures, and the public being ignored or refused on the grounds that higher education did not fit the military, industrial, or business model of productivity. While there is much in higher education which cannot be quantified, this is not sufficient reason for the inability to answer legitimate (and some illegitimate) requests for data or measures of productivity or accountability.

The Kansas model is noteworthy because in spite of the political considerations already mentioned, the Kansas model told it "like it was." This may not have been the original intent but it was the net effect. The faculty activity analysis is especially noteworthy. Unquestionably it had its limitations. Any self-report instrument has inherent limitations. The first activity instrument was a remarkably valid document which preceded the NCHEMS sample faculty activity instrument by years. The Kansas instrument was developed with much sweat and tears but at very minimal cost. It became abundantly clear as the design phase of "Guidelines II" was nearing an end that the same care, concern, and planning had not gone into the second faculty activity analysis instrument (a modification of the NCHEMS instrument) that had gone into the "green sheet" (the Kansas faculty activity analysis instrument developed in 1971-72). Nonetheless, the Kansas efforts in faculty activity analysis not only contributed to the literature in that field but also materially contributed to statewide planning.

The physical planning studies were noteworthy because they documented the need for planning (especially in a period of declining enrollments) and again provided compatible and comparable data. For the first time in Kansas, planning and programming preceded requests for physical facilities instead of building first and making programs meet the facilities.

The concern now in physical planning is whether, especially in tight economic times, the three-quarter of a million dollars spent in planning and consulting will be wasted and the former traditional "squeaky wheel" approach will prevail in capital construction and even more importantly in renovation, remodeling, and replacement of facilities.

Finally, the test of the whole model will be whether the various documents gather dust or will they be studied, reviewed, updated, and implemented? This presentation has stressed the importance of the personnel involved. The author feels this was the most critical factor in the success of the Kansas model. Some of the principal parties are now gone; as time passes more will go or fade. The final question is: will the model and its sequel flourish with new people (legislators, Regents, staff, and administrators) or will the fruits of the Kansas model wither away in frustration?

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DATA, RESPONSE TIME AND FREQUENCY OF USE: A STATEWIDE SERVICE ANALYSIS

James J. McGovern, Connecticut Commission for Higher Education

According to a recent study by the Rand Corporation, hardware costs amount to about one-third of the total data processing expenditures in higher education. The rest is involved in developing programs, software, and maintenance. The costs in telecommunications have been decreasing significantly in the past few years as a result of Telpak and other telephone company packages. The economies of scale for storage and computer processing are related to price by a square root proportionality. For instance, three times the price gives nine times the capability. After these technological trends are understood, it is then the task of states and universities to structure themselves to be in a position to take advantage of impending developments.

In Connecticut, with many of the public colleges having their own computers, saving money by planning future developments was basically a case of somehow sharing programs and program developments. This, in turn, requires a mechanism of laying out data in a standard way so that a program developed at the one institution will be stored in a format that can be accessed and used by other institutions.

The requirement for a common file system brought us to the need for a data base management system accessible to all state colleges and universities. By definition, a data base system is a "growing community of data designed to serve a growing community of users." The data base management system makes the dreams about a management information system (MIS) a technical possibility. The data base system is *data* oriented rather than *program* oriented. This allows data to be arranged in many different ways from many different files (e.g., student, faculty, financial, etc.). "Data management" is the secret to having flexible MIS.

The traditional, separate file systems limit the ability to compare different types of data. For instance, in Connecticut, a typical problem is to have course information on one file or computer tape and student information on another file or tape. If a new application requires the use of both sets of data, a program must be developed which will logically relate the data on the two files. On the other hand, the data base structure itself contains the logical relationships. The data categories and their links to each other are part of the data base structure. Consequently, any data can be related to any other data; the efficiencies come from good design in data storage.

The data base management system allows data to be entered once and various application programs (past, present, and future) to go against the data. Thus, programs and data are independent of each other and so can be changed independently—saving thousands of programming hours. Having *one file structure* means programs can be used by every institution in the state and the colleges can be assigned to work on *different parts* of administrative data processing. Also, maintenance which consumes about 60% of data processing efforts can be done once in rewriting programs, updating codes, data . . . etc. and then benefit everyone.

The trade-off of having a data-oriented system rather than a program-oriented system is that you must have a good idea of all the data and how often it will be accessed from the very start. Compare Figures I and II. The difference between the two is like the difference between two national hamburger chains. One believes they know your needs and packages its product, while the other keeps the pieces (data) separate and puts it together "your way."

Unfortunately, college administration is not as simple as arranging accessible storage places for pickles, onions—but may be more like designing a large department store where the choice of where to store or locate things is not obvious. Relationships among items, customer traffic and item turnover must be considered. Data base consultants, such as Leo Cohen of Performance Development Corp., Trenton, New Jersey, suggest that a *service analysis* is necessary to have reasonable response times upon access to a data base system. That is, the files must be arranged so that the most frequently accessed data is stored "up front", while less used data is stored in the back recesses of the file structure.

An important consideration is that both present and future data needs be considered. Consequently, a statewide service analysis was undertaken in Connecticut wherein the data processing centers listed data, availability time (how fast), and frequency (how often). Next a plan was developed to obtain future data requirements directly from the administrators. The similarity of findings/results was remarkable and provided documentation of the similarity of college administration and the need for a data base management system—namely, data redundancy among administrative offices.

Outline of Results

The documentation accumulated during the statewide service analysis was extensive. The data was collected during an eight-month period, but could have been completed in four months if one unit had begun when requested. Wherever possible, results were shared among colleges to provide illustrative examples and motivation to those colleges delaying completion or saying it was "impossible" to do.

Services

The service analysis, among other things, provided a listing of every administrative computer program (service) in the state system of higher education.

The services were grouped into "systems" and then grouped according to the five NCHEMS data bases giving five pages of Systems by Schools. These pages provide some interesting analysis of the information required by different types of institutions of higher education. They also indicate priorities,

Figure 1

CONVENTIONAL SYSTEM OF INFORMATION REQUEST

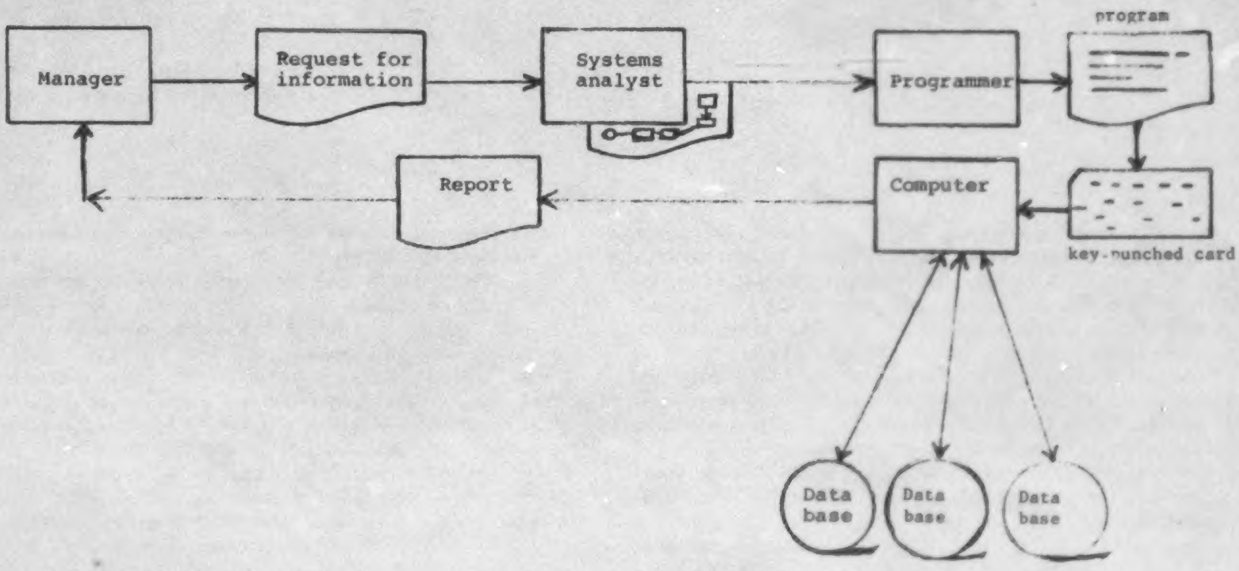
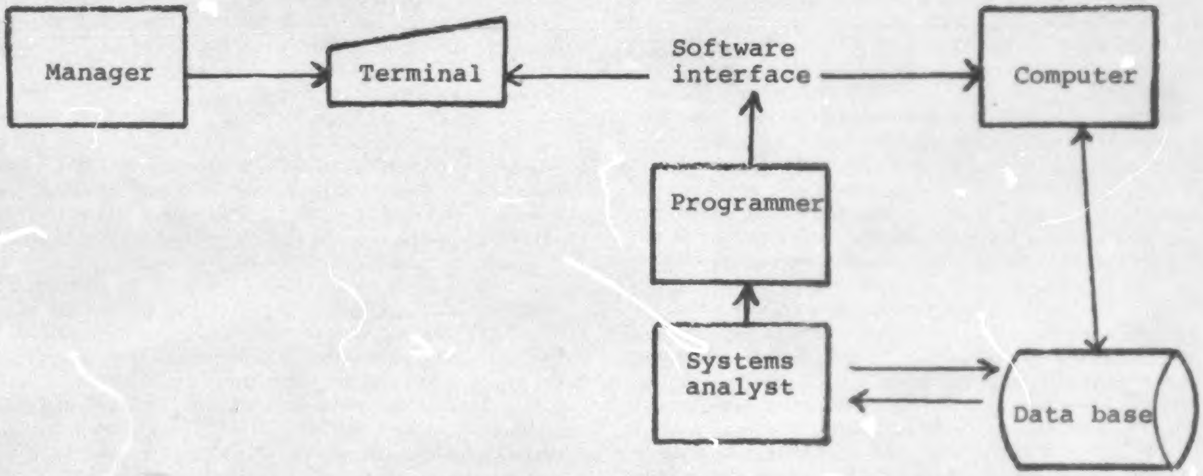

Manager
Request for information
Systems analyst
Programmer
program
Report
Computer
key-punched card
Data base
Data base
Data base

Figure 2

DATA BASE SYSTEM OF INFORMATION REQUEST


Manager
Terminal
Software interface
Computer
Programmer
Systems analyst
Data base

similarities and the "evolutionary steps" demonstrated upon comparing institutions at different developmental stages. The pages indicate *present* priorities in providing automated information for decision-making.

The next step in our service analysis was to obtain some indications about *future* computer service requirements. During this step virtually every college administrator in the state was interviewed. The form used in defining existing computer services was also used for describing future computer services. Consequently, as much as possible, administrators were asked to specify their needs down to the data element level giving both the availability (how fast) and frequency (how often) for the computer service requested. There were unexpected amounts of agreement even among different types of institutions. For instance, there was fairly good agreement as to what services should have rapid turnaround time. Indeed, some of the key factors for determining the cost-effectiveness of a teleprocessing application are present in the service analysis: availability and frequency. For instance, the admissions officer may want to have the 30-second availability of on-line registration, but its frequency of use may be only once a semester. On the other hand, the college accountant may "need" two-minute availability on a vendor file, but he accesses it as frequently as a dozen times a semester. Thus, although availability is the key factor in evaluating on-line applications, the frequency of access provides further information in evaluating choices.

In general, the more changeable aspects of administration were cited for rapid availability—indicating an almost on-going or continuous analysis—such as accounting, facilities inventory, class lists, etc. Services need for occasional or annual analysis, such as minority statistics, dean's lists, etc. would not have the same priority for on-line design.

It became increasingly evident during the interviews, especially at the University, that the new computer service requests could be satisfied by interrelating and interpreting the data presently maintained on separate files. In other words, our study indicated that the "additional data" needed for decision-making required the integration of different types of data. The study showed that data management was even more important than realized. For instance, the Registrar at the University of Connecticut requested a *Degree Audit Program* which would require accessing the Students File and Courses File and a *Scheduling Program* which would link the Courses File with the Facilities File. The data existed somewhere but was effectively unavailable.

The student area emerged as the most redundant and most in need of having one data base accessible to all the administrative departments. This is important in order to minimize inconsistencies of student data from department to department. Also, the subtle but important differences in general fund students, extension students, part-time, full-time, etc. invite automated help. A complete record of each student could be used for its several parts by the financial aid office, housing, billing, graduation, library, and security. Decision-making can involve several different sets of data.

Our studies indicated that the reconciliation of differences in two similar data programs are so subtle that administrators have found it easier to develop additional programs than to find the cause of the differences. Consequently, the conventional file systems beget more and more redundancy, inaccuracy, and questionnaires. We have found data inconsistency to be worse at the more developed institutions where different administrative departments update their files from different sources. Developing more conventional file systems will only make matters worse; all would welcome an integrated approach.

In summary, the information requested for future analysis was not new but rather the requests were for more timeless, integration, and more ability to expand without redoing large sections of past work. Many "services" requested were precisely the benefits advertised by a data base management system: better accessibility, large-scale integration and modular development.

The NCHEMS packages address many of the requests for management data; they do not address all the needs by any means. NCHEMS programs themselves could use a data base management system at their base to handle the changes and updates to their data. Thus, NCHEMS programs are one set of many application programs which can access a data base structure containing all the data of a particular college.

Data Elements

Every computer service has a number of data elements associated with it. For example, the computer service *Dean's List* requires such data elements as: courses, grades, student names, etc. After the data elements were collected for every service, they were entered on an index card with their frequency and availability times and then grouped to give accumulative scores for each element. When these frequencies of use were added for the various administrators, some data elements were found to be accessed hundreds of times per year. Other elements were accessed only a few times per year. The frequencies of use were surprising. This also brings us back to the earlier discussions regarding data management, namely, that data should be stored according to its access requirements first, and then according to its logical relationships.

The variance in frequencies of use of data elements was beyond expectations. Analysis is still in process but the results are extraordinary enough to perhaps recommend that data elements not be stored in the traditional, five NCHEMS data bases. In other words, the NCHEMS data categories may be fine for human processing but may not be the optimum arrangement for computer processing.

Experiences and Recommendations

There was a similar study (McGovern, 1973) in the New York City-Long Island area. That study was limited to determining faculty data elements but contained an extensive bibliography and a theoretical discussion of such analysis. The previous method was superior in that it allowed a statistical determination of "accuracy" of the consensus. It relied on the iterative process of successive delphi questionnaires. The questionnaire results were refined by successive rounds and a comparison of results from 2 independent groups of 15 colleges was made. The delphi approach was not used in Connecticut because of the insistence of our management consultants on the need for interviews. My conclusion at this point is that parts of both could have been done within the same time frame.

Although the results of the study give strong evidence for a data base management system, it should not be recommended to everyone. It requires cooperation on a rather good level. If components of higher education are "at war," this will probably provide more ammunition. Our experience in Connecticut showed that the service analysis provided an opportunity to involve top, middle, and lower management. It also allowed us to dissipate fears about the new system. We will probably repeat the service analysis every other year as a method to stay in contact with college administrators.

STATEWIDE SERVICE ANALYSIS

We learned that the president of each college must "direct" his data processing director to do the interviewing or else it will never get done. We found that the analysis must be viewed for its internal merits and not as a project to help the central office or state coordinating agency.

The phrase that probably won the most reception was: "Let us plan together and share results as they develop in the next few months." The study was only as good as the efforts on campus, and so it was essential to enkindle thoroughness on each campus. In one case, help (consultants) had to be hired to get a college moving. There also needs to be enough similarity of response among similar administrators to obtain "statistical results." On the other hand, every administrator should have been given clear possibilities to participate. That is, even if statistical reliability is not achieved, you must decide and design your data structure so all must indirectly give consent to the system.

According to the service analysis philosophy, it is easier to determine data needs and store the data according to accessibility than to try to anticipate the eventual interrelationships of various administrative systems. Having the programs "go against the data" means that programs and data are independent of each other. The independence will allow progress and sharing to proceed in both the area of writing application programs and updating data. Data management via a data base management system appears to be precisely what we need.

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PRELIMINARY STATE LEVEL PLANNING FOR HIGHER EDUCATION RETRENCHMENT

Larry K. Hayes, Oklahoma State Regents for Higher Education

State coordinating agencies are concerned with maintaining statewide systems of viable institutions to serve the higher education needs of their people. These agencies have recognized or soon must recognize that before the end of the coming decade, declining enrollments will force the elimination of many programs, the reduction of basic functions, and even the closing of some institutions of higher education. These agencies also recognize that inflation and other economic factors will undoubtedly force institutions to operate more efficiently if they are to maintain present standards of quality.

In Oklahoma, the Oklahoma State Regents for Higher Education have constitutional responsibility for establishing and maintaining standards of education as they apply to the higher education institutions of the Oklahoma State System of Higher Education. The State Regents also have coordinating, leadership, and planning responsibility.

Oklahoma institutions of higher education have not yet felt the full weight of this country's problems with inflation, unemployment, and power shortages or the effect of decreasing enrollments, but the time has come when Oklahoma and all other states must face these and other problems squarely. The Oklahoma State Regents feel that institutions must have help in making the changes necessary to maintain their viability. This is a report on the first steps taken and plans proposed for providing that help. From this project, criteria, standards, and procedures emerge to help Oklahoma institutions become more efficient while maintaining quality.

Enrollment Trends

Oklahoma has, since statehood, had a deep commitment for providing higher education opportunities geographically convenient to its citizens. As early as 1919, Oklahoma had a total of 20 state institutions. For many years, Oklahomans have pointed with pride to the fact that a very high proportion of Oklahoma high school graduates go on to college and that Oklahoma ranks high among all states in the ratio of state colleges and universities to population. A few people, however, focused their attention on the high number of small colleges scattered across the state in relatively unpopulated areas. They spoke out strongly against the financing of small, inefficient, and often ineffective institutions at the expense of the larger institutions in a state where the total resources for higher education have been limited.

During the decade of the 60s, Oklahoma grew into its system of higher education institutions. Students from Oklahoma and from across the country were grateful for an opportunity to attend college. In-state and out-of-state enrollments increased and new institutions were established in the two largest metropolitan areas of the state to help accommodate them. During the 60s the Oklahoma Legislature did not hesitate to supply the funds required to operate state institutions; the people of Oklahoma voted several times for bonds for expanding facilities and the State Regents approved virtually all requests for new educational programs. But the decade of the 80s will be a different story for Oklahoma. If present trends continue—birth rates, children in grade school, the percentage of second graders graduating from high school; the percentage of high school graduates going on to college; the ratio of first-time-entering freshmen to total full-time-equivalent students—Oklahoma can expect to have an increasing number of full-time-equivalent on-campus students through 1983-84, but must then expect the possible loss of a third of their on-campus full-time-equivalent enrollment during the latter part of the 80s.

Oklahoma can also expect drastic shifts in enrollment, with some urban institutions continuing to gain enrollment right up to 1983-84 and then losing a fairly small percentage of their enrollment, while some rural institutions which have already lost a significant percent of their on-campus students will be struggling to survive.

Enrollments, programs, and attitude changes have already occurred. Out-of-state students were the first to leave as education opportunities became available closer to their homes. Then, as the draft picture changed, many prospective students decided to break out of the mold. And as enrollments leveled off, legislators and the people began to talk about accountability and the State Regents encouraged institutions to drop courses and programs before requesting new ones. As the demands for efficiency and effectiveness grew, the demands for more varied programs to meet the needs of a more diverse student body increased.

It was at this point that the State Regents' staff decided that immediate action must be taken, that even though the state has approximately seven years to prepare for a radical decrease in enrollment, Oklahoma institutions will need to begin immediately if they are to remain viable. The question for the State Regents then becomes one of growth potential and the probability of efficiency: which of their institutions can probably make it with a reduction in courses and programs or changed functions; and which of their institutions may not be able to survive under any circumstances.

Institutional Viability

The State Regents' staff identified approximately 20 factors which were thought to be related to institutional viability. Institutional data were gathered concerning each of these factors to determine if they would discriminate between institutions and to provide information needed by the staff to determine the reasonableness of proposed standards.

The ten global criteria set forth below were identified as those factors most closely associated with institutional quality and efficiency. Along with each criterion is presented a standard against which each institution will be measured. In those few instances in which standards are to be derived on the basis of further research and study, the methodologies for arriving at those standards will be described.

1. *Institutional Size.* — The size of an institution is an important factor in its ability to deliver comprehensive, efficient and qualitative educational services to students and the public. To determine institutional size, the measuring stick of full-year, full-time-equivalent enrollment will be utilized. A minimum of 1,500 FTE enrollment will be utilized as a standard for state and other universities at the undergraduate level. A minimum standard of 1,000 FTE enrollment will be utilized for two-year colleges.
2. *Institutional Momentum.* — Whether student enrollment is increasing or decreasing is an important factor in an institution's ability to recruit and retain students, develop new educational programs, and maintain institutional morale. There is no such thing as "steady-state." An institution is either moving forward or backward. It is expected that all institutions should have increased or at least maintained a positive growth pattern during the past five years, a time during which state level enrollment has increased markedly.
3. *Per Capita Costs.* — The amount of resources per capita has long been recognized as an important factor to an institution's quality and efficiency of operation. The measuring stick of Educational and General expenditures per FTE enrollment for the most recent fiscal year will be utilized to determine per capita costs. Institutions will be measured against a standard within the limits of plus-or-minus one standard deviation from the mean for like type institutions in Oklahoma.
4. *Student-Faculty Ratio.*—The student-faculty ratio at an institution is reflective of and associated with cost-efficiency, quality of instruction, comprehensiveness of educational offerings, and quality of personal relationships on the campus. The number of FTE enrollment divided by the number of FTE faculty will be utilized to determine this measuring stick. Two-year institutions will be measured against the following standards: college parallel courses, 28 to 1; technical and occupational courses, 12 to 1. State and other universities will be measured against the following standards: lower division, 28 to 1, upper division, 20 to 1, and graduate division, 12 to 1.
5. *Number of Volumes in Library.*—The number of books, magazines, microfiche, audio and video tapes, and other learning materials is an important indication of an institution's comprehensiveness and quality. This factor will be measured by information derived from HEGIS reports submitted by institutions to the Department of Health, Education and Welfare. Institutions will be measured against the standards established by the American Library Association for number of library volumes according to size and institutional typem
6. *Average Faculty Salary.*—Average faculty salaries reflect an institution's ability to attract and retain qualified faculty members. This measuring stick will be taken from annual salary studies conducted by the State Regents. Institutions will be measured against a range of plus-or-minus one standard deviation from the mean of faculty salaries for like type institutions in the region of which Oklahoma is a part.
7. *Tenure Status of Faculty.*—The number and kind of faculty holding tenure at an institution bears a close relation to its quality of instruction and to the institution's flexibility of operation. Data to measure this item will be taken from a faculty questionnaire to be distributed and analyzed during the course of the current study to revise and update the Plan for the 70's. Institutions will be measured against a standard of having no more than one-half to two-thirds of their faculty members holding permanent academic tenure.
8. *Instructional Space Per Capita.*—The amount of instructional space per student is a measure of an institution's efficiency, comprehensiveness, and instructional quality. The amount of instructional space per FTE enrollment will be utilized as a measuring stick to determine this item. Institutions will be measured against a standard within the limits of plus-or-minus one standard deviation from the mean for like type institutions in Oklahoma.
9. *Comprehensiveness of Instructional Programs.*—The comprehensiveness of an institution's educational program offerings is an indication of its ability to meet the needs of its clientele and a measure of success in implementing its assigned functions. For two-year institutions, the number of technical programs and the percentage of students enrolled in technical programs will be the measuring stick used to determine comprehensiveness. For baccalaureate programs, the number of educational programs offered and the number of fields in which degrees have been conferred over the past five years will be the determining factor. State and other universities will be measured against a combination of two standards. These institutions will be expected to produce graduates in a number of fields within minus one standard deviation from the mean for like type institutions and to offer a number of baccalaureate educational programs within minus one standard deviation from the mean for like type institutions.

   Two-year institutions will be expected to offer a number of educational programs within minus one standard deviation from the mean for like type institutions, and to enroll a proportion of students in technical programs within minus one standard deviation from the mean for like type institutions.
10. *Instructional Expenditures.*—The proportion of Education and General (E&G) funds expended for the function of instruction is an indication of both instructional quality and efficiency. The amount of E&G expenditures per FTE enrollment will be utilized to measure this factor. Institutions will be measured against a standard of having expended at least 60% of total E&G expenditures for the function of instruction during the most recent fiscal year.

Procedures

Following the adoption by the State Regents of these criteria and standards, the staff began to compile needed information and data about institutions for making comparisons in the light of the standards. Much of this material is already in the files of the State Regents, and the remainder is scheduled to be considered during the course of the current review and updating of the Oklahoma Higher Education Plan for the 70's.

When all of the data for each of the ten measurement criteria have been compiled and validated, the standards adopted by the Regents will be applied to each institution. Those institutions which meet acceptable standards on seven or more of the ten criteria will be considered to be viable and no further analyses will be undertaken with regard to these institutions. Those institutions which come within the acceptable range on six of the ten criteria will be identified as marginal and further analyses will need to be undertaken to determine whether an in-depth study of these institutions will be required.

Those institutions which fall outside the acceptable range on five or more of the ten criteria will be identified as questionable, and further study will begin immediately with these institutions to determine what changes in functions, programs, resources, operational procedures, and the like need to be undertaken to ensure their efficiency and quality of operation.

It should be emphasized that the purpose of applying the criteria and standards presented here is to screen out those institutions which appear to be marginal or questionable for further in-depth analysis, rather than make definitive judgments about efficiency and quality based on the global criteria utilized in this institutional assessment technique. Therefore, no negative connotation should be inferred in regard to those institutions identified as marginal or questionable, pending further in-depth study based on more detailed and elaborate techniques and procedures.

In-depth Follow-Up Study

Plans for an in-depth follow-up study are in the talking stage at the present time and upon completion must be submitted to the State Regents for their approval. The Oklahoma State Regents' staff is developing specific, rather than global, criteria which they feel are related to institutional viability. These criteria will probably fall into two categories: those which must be met and those which should be met by each of the institutions scheduled for further study. Tentative plans call for each of the institutions to provide the State Regents with that information needed to determine the status of each institution relative to the specific viability criteria. It is hoped that the State Regents can request the kinds of information that will cause each of these institutions to develop the management information system needed by that institution for future planning and administration. It is envisioned that institutions would then be given approximately two years to provide the information requested. Each institution would probably need financial assistance to support its planning and data gathering efforts and the State Regents' staff would be available to provide technical assistance.

Tentative plans suggest that after careful study of the information provided by each on the institutions the State Regents' staff would compile a status report for each institution which would state specifically where the institution failed to meet established criteria. Each institution would then be involved in a briefing session at which time it would receive a copy of its status report. Each criterion would be reviewed in light of the information provided by the institution and the conclusions reached by the State Regents' staff would then be presented to the State Regents for adoption. The State Regents would provide a timetable for meeting the criteria for which the institution was deficient and explain the possible consequences of not being able to meet the minimum criteria.

The State Regents' staff would then outline the kind of assistance available to each institution from the State Regents to help meet the viability criteria and would explain the procedures for obtaining such assistance. The kinds of assistance that could be made available are as follows: technical assistance from members of the State Regents' staff; financial support for activities specifically directed toward the resolution of problems set forth in status reports; and cooperation from other institutions of the State system.

Institutions would be advised to develop a proposal to be submitted to the State Regents office which would spell out the kinds of assistance needed. The proposal would be reviewed by the State Regents' staff. Any changes would be worked out with the institution before being submitted to the State Regents for approval. The activities of each institution would be carefully monitored by the State Regents' staff.

The people of Oklahoma, legislators, and other concerned individuals and groups would be kept fully informed of each step taken by the State Regents in their effort to maintain State system institutional viability. Every effort would be made to let institutions know exactly where they stand and what they must do to meet State Regents' viability criteria.

State Regents' action would be taken to eliminate programs, reduce functions, or close the doors of those institutions which cannot meet the viability criteria in the specified period of time.

Consequences of State Agency Inaction

The three major consequences of inaction by state coordinating agencies could be the following: the stagnation of institutions of higher education; the inefficient use of higher education facilities and the loss of viability of some institutions; and the take over by other agencies in providing educational opportunity for the new clientele.

Faculty tenure policies and collective bargaining practices plus declining enrollments and restricted funding produce visions of present instructional faculties, educational courses and programs, and campus facilities remaining virtually unchanged for an indeterminate period of time. Higher education could well take on the aura of this nation's railroads. State coordinating agencies must take the lead in helping institutions maintain flexibility, so they do not get locked in with no room for change.

Population and enrollment shifts plus unrestricted recruitment practices and enrollment policies might well lead to overcrowded institutions in some sections of a state with demands for more space and additional student housing, while at the same time enrollments of other institutions become so small that costs to maintain quality become prohibitive and bond payments for existing dormitories become an impossibility. State coordinating agencies must take the lead in the establishment of statewide policies and practices which will make it possible for institutions throughout the state to remain viable.

A variety of agencies are standing in the wings with alternatives to the traditional system of higher education should the formal structure fail to change to accommodate the needs of the "new clientele," that vast number of people over 25 in this country who missed out on higher education the first time around or who need additional updating education. State coordinating agencies must take the lead in developing state level plans for an orderly, comprehensive move off-campus to offer educational opportunity to the new clientele at a time, in a place, in a way, and at a price that is acceptable to them.

STATEWIDE SYSTEMS FOR COOPERATIVE COMPUTING: BREAKING DOWN THE BARRIERS TO COMMUNICATION AND RESOURCE SHARING

Donald M. Norris, The Center for the Study of Higher Education
Richard B. Heydinger, Formative Evaluation Research Associates

The past decade and a half has witnessed massive growth in both academic and administrative computing activities in higher education. Computing facilities and budgets have mushroomed, and computing capabilities have become a new coin of the academic realm, mentioned in the same breath with library, laboratory, and classroom facilities. Moreover, institutions have experienced increasing pressure to fully utilize capacity in existing computers, to trim or hold down increases in computing costs, and to expand the availability of specialized computing resources without duplicating such expensive resources on every campus. Growing state colleges, in keeping with their emerging roles, have made especially heavy demands for new computing capabilities. Small institutions, burdened by precarious financial conditions, have sought ways to gain access to computing services without having to purchase, lease, or hire their own computing hardware, software, and resource personnel.

Advances in telecommunications technology have made it possible to access and utilize computing facilities from great distances. Using telephone lines, microwave links, or satellite communications, computers can be joined so that a user on one computer may access the processing capabilities of other machines. Similarly, computing software, data bases, and decision algorithms may be accessed via telecommunications. In a sense, therefore, computing has become "space independent." As a result of the growth of educational computing, the pressure for sharing of computing resources, and the capabilities provided by telecommunications, computer networking has developed. In the eyes of their supporters, networks offer educators a vehicle for both providing computing services cost effectively and increasing the level of service. Networks also provide a mechanism for overcoming many of the barriers to interinstitutional resource sharing. Some visionaries predict that computer networks will eventually link the instructional, research, and administrative computing capabilities of colleges and universities into a sophisticated accessible technological resource.

The list of on-going networking ventures involving educational computing is extensive and growing. A number of examples dramatically reveal the wide range of existing networking activities. ARPANET is an *international facilitating/communications* network linking the major research computers of a number of large universities and laboratories in the United States. ARPANET's primary contribution is in providing the communications service link enabling the automatic processing of major computing tasks on any of a wide selection of specialized computers which is best suited to the task. A variety of *disciplinary* networks have been created to provide special services to users in different academic disciplines. The National Center for Atmospheric Research (NCAR) is the hub of a network serving the atmospheric researchers across the nation. The Interinstitutional Consortium for Political Research (ICPR) provides political scientists with access to information bases and special software programs. A number of *regional* networks serve different portions of the country. The New England Regional Computing Program (NERComp) facilitates institutions in the Northeast that need access to computing facilities at a number of New England colleges and universities. As of the end of 1973, the National Science Foundation (NSF) had sponsored 28 regional computer networks through its Regional Cooperative Computing Activities Program. Most of these networks involved smaller institutions accessing one of the major educational facilities in the state. Finally, a significant number of states have created *statewide* educational computing networks (Mosmann, 1974). While some statewide networks evolved from existing NSF regional networks, the statewide systems are usually more complex and involve a more complicated set of political, organizational, and financial issues.

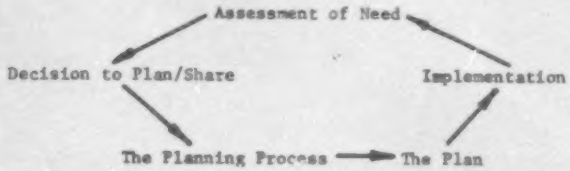
Statewide cooperative computing has afforded educators with an instrument for addressing goals related to computing and to the statewide coordination of higher education. Indeed, the greatest distinguishing feature between statewide cooperative computing and other types of networking has been the active involvement of state government and state coordinating agencies in the creation of statewide systems. The characteristics of the resulting statewide computing networks are important subjects for study. However, examination of the elements of the entire *statewide cooperative computing process* provides valuable insights into the means through which interinstitutional sharing is undertaken. These insights may be helpful in considering future computer networking activities and in encouraging other forms of academic resource sharing. The remainder of this paper examines the statewide cooperative computing process and its implications for resource sharing in higher education.

The Statewide Cooperative Computing Process

The authors are currently involved in an EDUCOM-sponsored project that is focusing on the process through which states have created statewide computing systems. Our research consists of a national survey of all 50 states and several case studies that investigate a number of states in depth. While a full reporting of our findings if far beyond the scope of this paper, a limited synopsis of our process model will demonstrate the means through which states break down the barriers to interinstitutional cooperation. Our research indicates that this model is a useful instrument for analyzing and comparing the cooperative process even in states with significantly different characteristics. Figure 1 provides a very rough schematic diagram of the process model.

Figure 1

THE STATEWIDE COOPERATIVE COMPUTING PROCESS



The statewide cooperative computing process is a repetitive cycle. At any point in time, different states may be at a different stage in the process. Also, states may be in their first, second, or even third repetition of the cycle. The *assessment of need* is the act of evaluating the effectiveness of existing computing cooperation or of determining that a performance gap exists that can be addressed through interinstitutional sharing. The *decision to plan/share* may be directly mandated or it may be encouraged by a variety of indirect mechanisms. The *planning process* and *the plan* are the process and product through which a blueprint for cooperation is created. *Implementation* includes the activities that result in an operationalization of the cooperative plan. Following implementation, the stage is set for evaluation of the effectiveness of cooperation, determination of whether it is adequate to the needs of the educational institutions in the state, and a possible repetition of the whole cycle.

To enable a discussion of each stage in the cooperative process, it is necessary first to identify how far each state has progressed in considering statewide cooperation. Table 1 portrays the scope of the most recent statewide computer planning process. Fully 25 states have engaged in some form of statewide computer planning. Of these, three have engaged in statewide computer planning that encompassed computing in all state government agencies, including higher education. On the other hand, 20 states involved all public higher education in the planning process. One state which involved all public higher education limited its planning to the sharing of academic computing alone; another state acted similarly for administrative computing. In addition, four states have engaged in systemwide planning. This type of major planning activity involved all of the institutions within a system of institutions, such as the state colleges or state universities. Finally, one state engaged in regional planning within the state. Although a number of state plans have recommended regional sharing arrangements, only Florida used separate yet coordinated planning activities in a number of clearly-defined regions in the state. Finally, 6 of the 30 states that engaged in regional, statewide or systemwide planning had previously participated in a cycle of statewide or systemwide computing planning.

In examining the states that have not engaged in planning beyond the institutional level, a number of relationships emerge. First, 5 of the 20 have only one public institution and therefore have no real need for statewide planning. Second, another five have experienced interventions that are expected to culminate in statewide planning soon. The remaining states include states that seldom employ statewide planning and some states in which planning could begin at any time. From the examination of the 50 states, it is clear that interinstitutional computer planning is an increasingly important phenomenon in higher education.

Analysis of the stages in the cooperative computing process reveals how and why this planning process occurs. The *assessment of need* is performed by a variety of parties including individuals at the educational institutions, the state coordinating/consolidated governing board, the state government agencies or the legislature. In assessing the effectiveness of existing cooperative activities, or in defining a performance gap that can be answered by interinstitutional cooperation, these parties may be motivated by such goals as trimming computing costs or holding down increasing costs, expanding services without massive proliferation of computers, or imposing a degree of coordination on educational computing. Not only do existing cooperative ventures in higher education influence the assessment of need, but cooperative computing among other state government agencies serves as a powerful role model (NASIS, 1974). Individuals at the institutional level generally assess needs differently and have different computing goals than do individuals in state coordinating boards and state government agencies. Hence, most of the assessments that planning/sharing is necessary are made by agents external to the educational institutions.

The *decision to plan/share* is generally requested or mandated by a party or agency external to the individual institutions, although the institutions often have the option of refusing to go along with the request. In many states, the request to plan for sharing is accompanied by some form of an "intervention" that is designed to encourage the institutions to share. For example, the state government may place a moratorium on the acquisition of new hardware or may place a freeze on computing operating budgets. Or the state coordinating board may refuse the computing requests of specific institutions, thus forcing the institutions to resort to cooperation to increase their computing power. In some states, the active centralization of computing in other state agencies encourages the institutions to at least go through the motions of planning—lest they be next. And in many states the threat of a statutory reconstitution of authority over computing hardware acquisitions is a strong incentive to participation in cooperative planning.

Our research also shows that 35 states have experienced some form of intervention that either has accompanied the decision to plan, has preceded the decision to plan, or has attempted to initiate planning. In some states the statutory authority to mandate planning is clearcut and no intervention is needed. In other states the intervention occurs concurrently with the decision to plan as an added incentive to serious planning. In a number of states the intervention effectively serves its purpose of bringing the institutions to the planning table. But in other states the institutions have been able to experience interventions without succumbing to interinstitutional computer planning.

The *planning process* may vary widely from state to state. Different states utilize mechanisms that incorporate different degrees of directiveness. For example, some states rely on the staff of the coordinating board or on consultants to produce the computer plan. Other states use staff in conjunction with advisory committees, while most states constitute a planning task force that bears the burden of developing a statewide plan. Also, the participants in the planning process represent a variety of constituencies. Some states utilize a nar-

Table 1

THE SCOPE OF THE MOST RECENT COMPUTER PLANNING PROCESS (50 STATES)

I. Statewide Planning Activities

All State Government Computing (3)

1. Maryland*
2. Mississippi
3. Wyoming

All Public Higher Education (20)

1. Arkansas
2. Colorado
3. Georgia
4. Illinois
5. Kansas
6. Kentucky
7. Louisiana*
8. Montana
9. Nebraska*
10. New Jersey
11. North Carolina
12. Minnesota
13. North Dakota
14. Oregon
15. South Dakota
16. Virginia
17. Tennessee
18. Washington
19. West Virginia
20. Wisconsin

All Public Higher Education (1)
Academic Computing

1. Indiana

All Public Higher Education (1)
Administrative Computing

1. Connecticut

II. Systemwide Planning Only (4)

1. California (California State College and University System)
2. Massachusetts (State College System)
3. New York (10 liberal arts colleges in SUNY System)
4. Pennsylvania* (State colleges and secondary schools)

III. Regional (1)

1. Florida

IV. States Having No Major Planning Beyond The Institutional Level (20)

States Having Only One Public Institution (5)

1. Alaska
2. Hawaii
3. Maine
4. Nevada
5. New Hampshire

States Having an Intervention Likely to Result in Planning (5)

1. Iowa
2. Ohio
3. Rhode Island
4. Texas
5. Utah

Others (10)

1. Alabama
2. Arizona
3. Delaware
4. Idaho
5. Michigan
6. Missouri
7. New Mexico
8. Oklahoma
9. South Carolina
10. Vermont

*—Planning is in process.

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row representation, while others involve representatives from all types of educational institutions, the consolidated governing board or statewide coordinating board, state government agencies, industry, consulting firms, and the legislature. The participants in the planning process often come from different positions within their organizations and thus provide different computing perspectives and different levels of computing expertise. The combination of the directiveness and participativeness of the planning process influences the outcomes.

Similarly, the *plans produced* are quite distinct. Different plans use different approaches in stipulating the general goals of computing cooperation, the computing resources to be shared, the institutions that might participate, the delegation of powers, and the organizations that will administer sharing. Interestingly, in most states the plan does not exhaustively stipulate the specific sharing arrangements that will eventually evolve. Instead, the plan identifies goals for cooperation, delegates powers for future decision-making, and identifies organizations or institutions/agencies that will serve as resource brokers. We have termed such an arrangement an "enabling network." The hard decisions regarding hardware acquisitions, specific sharing arrangements, and network governance are left to the future, to be made under the provisions of the plan. Under this procedure, the implementation process is the critical period for computing cooperation, even though the earlier stages certainly contribute to the eventual success of implementation and cooperation.

The plans address a number of specific computing needs or goals. Excess computing capacity at the major public university(ies) is utilized by designating these institutions as brokers that will sell services to other institutions with less extensive computing capabilities. In states with more than one public university with major computing facilities, the brokerage role may be split or the institution with the most extensive existing networking activities may be designated as broker. The state colleges and universities are generally the institutions most in need of increased computing capabilities. Indeed, the effective and efficient servicing of the growing needs of state colleges is perhaps the major goal of statewide cooperative computing.

As a result of the *implementation* of the goals and specifications of computing plans, a number of types of cooperative arrangements have resulted. The arrangements have encompassed a variety of computing resources. Some states establish what is known as a "star network" in which institutions with lesser computing capabilities access the major computer facilities at another institution. Some states have created regional star networks in which regional computing brokers are accessed by other institutions in the region. Some institutions have created "distributed networks" in which two or more institutions mutually access each other's facilities. Other states have created hierarchical systems combining these elements. For example, Kentucky is planning a system in which the large computing facilities are linked in a distributed network and smaller institutions form star networks linked to the major facilities in each region. Mississippi is planning a system in which regional star networks are linked to a central computing facility in the state government computing agency.

In attempting to implement the state computer plan, the challenge rests with the state to translate this document into action. It is at this stage of the process that any implicit agreements in the plan must be negotiated and decided. In other words, the "writing between the lines" must come to life. The real willingness of the institutional parties to share is put to the test, and the coordinative powers of state government are often evidenced. As might be suspected, in some states the resulting implementing organization does not always resemble the proposed structure of the plan; and in some states progress has never been made beyond the completion of the plan.

In those states that have chosen to empower or establish an educational computing "office" to oversee implementation, three organizational patterns are emerging. Not surprisingly, many states (14 of 22) have empowered a person or an office within the higher education coordinating board/governing board to implement the state plan. Two other states have delegated to an existing state governmental computing agency the responsibility for implementing the state plan and providing computing services to public institutions.

One of the most often discussed implementing organizations is the "third party (not-for-profit) corporation" or consortium. In this case, appropriate representatives from across educational systems come together to form some type of organization for the express purpose of providing computing services to educational users. To date, five states (New Jersey, North Carolina, Illinois, Washington, and Minnesota) have established or are in the process of establishing these types of corporations or consortiums.

Significant issues and concerns face these statewide implementing organizations. Initially, a priority of action must be agreed upon. For example, should the state computer organization move immediately toward the establishment of regional data processing centers or should a statewide instructional timesharing network be implemented? Also, appropriate representatives must decide how to best govern this statewide organization. Users of the computing services will demand input, and each institutional type will want to guarantee that their concerns are represented. Those actions which threaten an institution's autonomy will be met with severe resistance. And finally, the statewide computing organization as well as the legislature must determine how to evaluate the effectiveness of this new conglomerate.

States which are implementing their statewide plans are confronted with all of these issues. The authors are currently analyzing interview data from three states which will provide much-needed insight into the process of operationalizing plans. Therefore, it is premature to draw definitive conclusions on the important factors of operationalizing a statewide plan. Nevertheless, it appears that cooperative computing must combine the proper degree of directiveness, participation, and technical expertise to succeed. The directiveness is provided by interventions, the direction of the planning process, and implementation organizations having appropriate powers and the willingness to use them. Participation comes from the involvement in planning and implementation of appropriate representatives from the proper constituencies. Technical competence and varying computing perspectives should be present in the proper combination at all stages in the process. The ability the address the politics of interinstitutional cooperation is essential. The interaction of these factors will largely determine the success of failure of implementation.

In summary, statewide cooperative computing is a significant, growing form of interinstitutional resource sharing. Most states have engaged or will soon be engaging in statewide, systemwide, or regional planning for computing cooperation. In contrast to other forms of computing networks, statewide cooperation involves a much higher level of direction from and participation by agents external to the educational institutions. By examining the statewide cooperative process, one gains insights into the mix of factors that creates successful resource sharing. Such insights may be useful in other forms of cooperative computing and in other forms of academic resource sharing.

Implications of the Growth of Cooperative Computing

In its own right, the growth of statewide systems for sharing educational computing is an important issue for higher education. However, it is critical to view this development in perspective. Existing statewide systems may be only an intermediate stage in the ongoing process by which the barriers to interinstitutional resource sharing are surmounted. Statewide networking also interacts with regional, disciplinary, international, and special service networks. All of these networks will combine to determine the networking environment of the future. This environment will have important implications for how individual users utilize computing resources and how institutions, groups of institutions, states, and even nations plan for providing computing services. Moreover, these networking arrangements may provide the means for sharing other academic resources. Thus, the relative importance and potential implications of statewide systems and networking, in general, have important implications for decision-makers and educators at all levels.

Statewide cooperative arrangements are currently in a state of flux. First, the development of advanced minicomputers has challenged the reliance on large central computers. Most computing users can have 95% of their tasks accomplished by the capabilities provided by minis. This is especially true for state colleges, the major group of institutions serviced by statewide system accessing arrangements. An interesting adaptation is the development of hierarchical networks in which a large central computer is linked to "intelligent terminals"—terminals containing a minicomputer—that perform relatively simple jobs on the mini and route more complicated jobs to the central facility. Second, statewide networks are understanding the difficulties in communicating experienced by computing users of differing levels of sophistication and need. For example, the users within a discipline, or users at Michigan and Berkeley have much more in common than do users at Michigan and at Eastern Michigan. These factors suggest that many existing cooperative arrangements may be short-lived, soon to be replaced by other sharing/service alternatives. However, the role of existing statewide systems in forcing institutions to consider sharing and in abolishing the notion that every institution must have its own full-service computing center remains of paramount significance.

The new arrangements that evolve will depend on the alternatives available from other networking sources. The option of affiliating with disciplinary, regional, statewide, and special service networks is available to individuals, departments, or institutions, depending on the circumstances. The parallel development of different networking alternatives is part of the evolution of an accessible national science network, a goal long espoused by the National Science Foundation (Aufenkamp, 1973). Continually changing technical developments, the difficulties involved in creation of a single centralized national facility, and the needs of different users have mandated a diffused approach. Nevertheless, the networking efforts of academic disciplines, the support by the NSF of its ICS program and its Regional Cooperative Activities Program, and the efforts of various states to encourage computing cooperation have all contributed to the evolution of what may eventually be a national networking capability.

Such a national networking capability could result in "open networking" in which institutions, departments, or individuals purchase their computing services from whichever source made the most sense at the best cost (Massy, 1974). Under these conditions, the computing center of the future would be a specialized shop performing one or two particular functions exceedingly well. Only the major research institutions would require their own centralized computing center of this nature, although computing expertise would still be needed by all institutions. This sort of arrangement has substantial implications for computing management and planning. Among the most difficult issues are the valuation and pricing of services, "balance-of-trade" considerations, and the risk involved in competing in a market economy. The choice of the area of expertise—or the limitation of areas of expertise—is also crucial. In addition, the problem of serving and being responsive to the needs of users beyond the institution's own academic community raises issues of governance and control that are alien to the experience of most universities.

Computer networking has implications for other types of resource sharing as well. For example, new technological advances are making computer networking more feasible and are enabling computing networks to become vehicles for sharing other technology-based resources. With the expected, widespread introduction of packet switching in the next decade, commercial telephone lines and suitable adaptive gear may enable resource sharing that is far less expensive, more easily initiated or terminated, and far more adaptable than what is available today. Such resources sharing capabilities would accommodate computing hardware and software, library resources, audio-visual materials, television transmissions, data bases, decision algorithms, and similar resources.

An equally significant contribution of computer networking lies in its serving as a model of cooperative behavior. As the technical problems are solved, computer networking is addressing the orgainzational/political barriers to academic resource sharing. Successful networking erodes institutional resistance to interinstitutional sharing. It also provides reinforcement to external parties that are encouraging academic resource sharing. The extent to which computer networking and other technology-based resource sharing will encourage the sharing of more traditional academic resources is highly debatable. There are significant educational and practical barriers to such sharing, in addition to the organizational/political difficulties. Nevertheless, the impact on the sharing of traditional academic resources should be monitored.

Computer networking is obviously a development that should be watched by leaders in the field of higher education. First, cooperative computing provides the potential for cost savings, service enhancement, and revitalization important in these times of financial retrenchment. Moreover, networking may be the only means by which most institutions are able to afford achieving access to new generations of computers. Second, attention must be given to the coherent development of interdependent networks serving different users' needs. The achievement of an extensive national distributed network requires interaction between parties at the disciplinary, institutional, state, and national levels. Third, evolving patterns of open networking raise important planning and management implications for colleges and universities. These implications cannot be abandoned to computing specialists alone, because, in addition to technical issues, they entail important strategic policy considerations that require attention at the highest level. Finally, computer networking and related potential areas of resource sharing focus the future of the university. They provide hints of what one aspect of higher education may be like in the future. Such glimpses are important to the ongoing planning of the development of American higher education.

COOPERATIVE COMPUTING

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STATEWIDE DATA COLLECTION FOR DECISION-MAKING: THE KANSAS SCENE, FACT, FICTION, FRACTION, FRUSTRATION, FRICTION OR FRUITION?

J. Stanley Laughlin
Emporia Kansas State College

Strike the Match

Systemwide data gathering at the state level has taken approximately as many forms as the number of states within the United States. A few states are highly organized for this specific purpose and others have little or no network for operation. Kansas established a systemwide data collection procedure in early 1971.

Some of the actors that struck the match were the state legislators when they began questioning institutions about items such as faculty load, budget, number of students who became attrition statistics, management techniques, and questions about student unrest and student uprisings in the late 1960s.

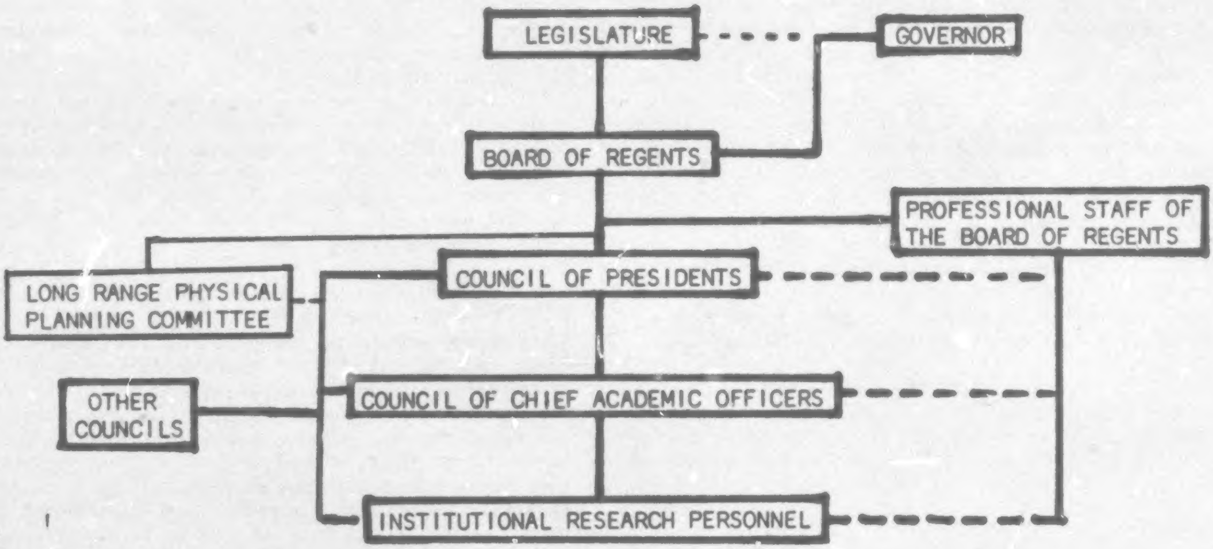
The Kansas Board of Regents which governs three public universities, one public medical school, three state colleges and partial involvement with one municipal college began to ascertain methods that could be employed to answer state legislators' questions. The Board of Regents' professional staff organized groups by drawing representatives from the three universities and three state colleges together to form a statewide institutional research network. Since the Spring of 1971, the Kansas Institutional Research Personnel (IRP) group has met monthly.

Detailed questions of the state legislature and the Board of Regents' professional staff search for data were matched with organized management outputs systems, such as the National Center for Higher Education Management System (NCHEMS), forming the background motivation for systemwide data collection. These three matches were the main functions that affected Kansas statewide data collection.

The institutions involved in the discussion herein are: three state universities—University of Kansas, Kansas State University, Wichita State University; three state colleges—Emporia Kansas State College, Kansas State College at Pittsburg, Fort Hays State College; and the Board of Regents' professional staff.

Figure 1

RELATIONSHIP OF THE INSTITUTIONAL RESEARCH PERSONNEL WITHIN THE ORGANIZATION FOR DATA GATHERING AND DECISION-MAKING OF KANSAS SENIOR COLLEGES AND UNIVERSITIES


LEGISLATURE
GOVERNOR
BOARD OF REGENTS
PROFESSIONAL STAFF OF THE BOARD OF REGENTS
LONG RANGE PHYSICAL PLANNING COMMITTEE
COUNCIL OF PRESIDENTS
OTHER COUNCILS
COUNCIL OF CHIEF ACADEMIC OFFICERS
INSTITUTIONAL RESEARCH PERSONNEL

STATEWIDE DATA COLLECTION

Light the Fire

At the insistence of the Presidents of our institutions and the Board of Regents' professional staff, sets of council were established. The Council of Presidents (COPS) is answerable to the Board of Regents, the Council of Chief Academic Officers (COCAO) is answerable to the Presidents and the Institutional Research Personnel (IRP) is answerable to both the Presidents and COCAO. Other councils established which were important were the Council of Business Officers and the Long Range Physical Planning Committee.

An important concept was the manner in which these councils were established. Each group is a total cooperative in its own right. Each is composed of one member from each college or university and one member from the Board of Regents' professional staff. These representatives are the individuals responsible for the type of council formed. For example, each institutional representative on the IRP committee is an institutional researcher on his or her own campus. Each member of COCAO is the Vice President responsible for academic affairs on each campus.

This representation from each institution gives the institutional personnel a feeling of deep involvement in decision-making in contrast to an imposed regulations system. It allows each institution to check and double check with each of its members to ascertain outcomes of decisions, assuming that decisions do not have to be made on a rush basis. It, however, is more time consuming and more costly than other systems because of the number of members on each committee. However, the real feeling of involvement and ownership is a strong overriding relationship to cost.

Three main energies that lit the fire were the development of a Kansas master plan, the Long Range Physical Plan, and the desire for cooperation. The master plan and the facilities plan were results of pressures from the legislature, and the cooperation was an outgrowth of the college personnel within the system. No one person or group planned this cooperation, but it was desired because each institution wished to maintain its own autonomy.

Fan the Flame

The air which was pumped through the forge that formed the early working policies and practices of the IRP committee was the details of the master plan. The Council of Chief Academic Officers asked the IRP to collect data and make recommendations to them on six fields of inquiry. COCAO gave IRP the latitude to design the studies as IRP conceptualized the task. The six areas were: (a) college and university enrollments; (b) admission, retention and attrition; (c) faculty activity analysis; (d) college and university programs; (e) equalizing educational opportunity; and (f) research (see *References* for papers on these topics).

Observation of these topics illustrates the magnitude of the labor to be expended during those first two years of existence. IRP developed numerous decisions regarding definitions, as well as original study designs, before the collection of data began.

To illustrate the outcomes of such effort and the decisions made based upon those data, two areas are considered from the above six topics. Platt and Tarrant presented two other topics at the May, 1975 Association For Institutional Research (AIR) Seminar. The two areas discussed herein are the admissions, retention, and attrition study and the college and university programs study.

Two separate components were developed within the admission, retention, and attrition study (Tarrant, 1972). One portion described historical data on retention and the second portion contained a survey of admission practices and policies. Each institution took a random sample of entering 1966 freshmen and searched for the outcomes of those students five years and one summer later in the retention study. What was sought were the percentage of students who graduated from the entrance institutions, percentage that transferred among the participating institutions, and the percentage that became attrition statistics.

Concerning the college and university programs study (Platt, 1972) each Regent institution reported student credit hour production by the Higher Education Generaal Information Survey (HEGIS) discipline and speciality and by level of course. Degree production was obtained for the 1971 fiscal year by the Program Classification Structure (PCS) of the National Center for Higher Education Management Systems (NCHEMS) at WICHE. Data from that study and data from graduate deans resulted in the Council of Chief Academic Officers placing 71 degree programs on provisional status and recommending 63 others to be discontinued. Such was the outcome of decision-making based upon one study.

These six endeavors were the travail that fanned the flame of the structure of decision-making for IRP in Kansas during the period 1971-72. The results of efforts and outcomes of those years are best described in a publication by the Board of Regents, entitled, *Guidelines for Increasing Academic Efficiency at the State Colleges and Universities* (December, 1972).

Add the Fuel.

These studies led into other areas which the IRP and the COCAO committees have continued. As an outgrowth of the collection of student credit hour data, there was a felt need for a common course numbering system within the Regents' institutions. Therefore, IRP recommended that an 11 number coding system be adapted for common course numbering. Each course number allowed for identification of the college, the department, the course number, the Program Classification System subspeciality number, and the type of instructional delivery normally utilized. The common course numbering system has been approved in Kansas Regent institutions and has been operative two years.

Recommendations have been made to the institutions by the IRP germane to data bank capture and maintenance. The NCHEMS *Data Element Dictionary* was utilized as the document which gave the basic data for recommendations. Those recommendations have been incorporated into the computerized data banks.

Early study revealed that a need existed for an improved budgeting system. The state organized a committee from the Council of Business Officers, the Council of Academic Officers, and the Institutional Research Personnel to develop, as a first step, a formula budget system. After collection of certain instructional information and operational costs by the PCS program levels, that group began to look at supportive and administrative costs. The Formula Budgeting Committee bogged down in communication problems and no further movement has been made. The elements studied have not been utilized to date. Perhaps the main reason was that the formula budget system was such a drastic change from the traditional accounting method that no one group felt a strong need to proceed.

Neither the Business Officers, the Presidents, nor the Board of Regents saw the need for such a system and those groups seeking the change may have raised fears within the minds of those who work daily with budgets. Formula program budgeting is presently being reconstructed within Kansas Regents' institutions.

Another outgrowth of the IRP group has been a degree inventory which has been published yearly for three years.

Figure 2

COURSE NUMBERING SYSTEM

The position code structure for the Course Numbering System will result in an 11 digit course identification number as shown below:

1	2	3	4	5	6
2	2 1	1 0 0	3	1 9	0 5

1 = College
2 = Department
3 = Course level & no.
4 = Type of course
5 = Program category
6 = Program subcategory

An example of the code for an Undergraduate-Lower Division lecture course in Chemistry is: 221 100 0 1905

An example of the code for a Graduate I appointment course in Chemistry is: 221 800 3 1905

Course Levels—

000—099	No credit courses.
100-299	Lower division, undergraduate. Designed as freshman-sophomore courses.
300—499	Upper division, undergraduate. Designed as junior and senior courses.
500—699	Upper division, undergraduate. Primarily for juniors and seniors, but including some Graduate I students.
700—799	Graduate and upper division. For Graduate I students primarily, but including courses with some undergraduates.
800—899	Designed primarily for Graduate I students.
900—999	Designed primarily for Graduate II students.

The last four digits of the course identification number will be used to identify the program category and program subcategory as defined in the manual *A Taxonomy of Instructional Programs in Higher Education* (U.S. Government Printing Office, HE 5.250:50064, 1970). This is in compliance with an earlier commitment by the Council of Presidents to adopt the Program Classification Structure of the National Center for Higher Education Management at WICHE as a guide in data collection efforts.

Six instructional types of courses have been identified for incorporation into the course numbering system.

The IRP group has completed the second faculty activity analysis this past Fall, 1974, with six tables printed at the departmental and HEGIS program level. A second Long Range Physical Facilities Plan is now being developed to project space needs to 1984 at each of the institutions. And, this past year, the IRP and COCAO have combined forces and data analyses for a systemwide undergraduate study, with a report being published in March, 1975. Finally, IRP has made recommendations to various groups about needs regarding enrollment reports, studies of course leveling, studies of course typing, formulae for costing education graduate programs, and collection of space needs of academic programs.

Bank the Embers

The discussion of the system in Kansas focuses upon various conceptions. The most important concepts of this statewide system wherein each institution wishes to remain autonomous are cooperation and a felt need to improve data gathering and decision-making. In addition, a very important feature was the background input by the various members of the councils. By having institutional representatives involved in decision-making, the total group capitalizes upon the strengths of various members. Even though this procedure is time consuming, considering the traveling time in a state like Kansas, the number of personnel involved in decision-making, and the paper work involved, it has been felt that the inputs have been very valuable.

Cooperation allows the individuals from institutions and the state agency to identify the need for such data, explain the use of such data, and to be a participant in ownership. Cooperation also allows for people who are within the profession to govern themselves rather than be governed by imposed regulations. Indeed, the system has been fortunate that the institutions and the State Board Office have had input into legislative bodies, which serve as an illustration of self governance.

The second important concept is a willingness of personnel to improve upon the data gathering and decision-making system. Each group within the statewide organization must have members in decision-making positions who desire to improve the network. One of the problems within the Kansas system of data collection for decision-making has been within the area of formula budgeting. Part of this failure to proceed was that the majority of the groups in position of decision-making who dealt with the budget were reluctant to move ahead. The desire for improvement by the majority of the groups participating is highly important for effective maintenance in a cooperative system. When this desire stops or someone at a higher level of decision-making has no organization to turn to for input, imposed authority often prevails.

The several Councils allow for a check and balance system on recommendations, i.e., a recommendation from the IRP to COCAO to COPS to the Board of Regents. It allows for the decisions to be tested, questioned, and analyzed within different political contexts. For example, the institutional research people must answer more to the people with the institutions, whereas the Council of Presidents may be more answerable to the Board of Regents.

A point of benefit to intra-institutional analyses should be mentioned. One advantage of having personnel involved in statewide analyses is that it encourages one to return to the home institution asking questions about intra-institutional operations. Involvement in comparative data collection from other institutions allows one to have data to analyze one's own institution more effectively. For example, in observing faculty load data from the universities and colleges, one finds that there are certain disciplines that appear to have similar loads in the universities as well as the state colleges. In addition, one also finds great differences among institutions in other disciplines. Therefore, collection of comparable data can be an advantage for both intra- as well as inter-institutional comparisons.

One problem of a cooperative statewide system as in Kansas is that of maintaining some overview of all public higher education within a state. The Board of Regents governs the senior colleges and universities whereas the State Board of Education governs the junior colleges. Institutional involvement can become so engrossed with views about one system that a total outlook cannot be maintained. Naturally, like every state, Kansas has some in-fighting between institutions but presently there is more sense of pressure from segments external to the system than internal. The establishment of a coordinating board and/or a governing board to maintain a statewide overview of higher education brings mixed reactions from Kansas personalities.

Observe the Fire from a Distance

In summary, three topics should be considered with respect to the Kansas cooperative system: the strengths, the weaknesses, and the possibilities for the future. This paper has attempted to present the Kansas statewide higher education system of data collection and decision-making. A cooperative system built upon separate councils meeting, each having institutional representation, was described. Certain activities of data collection were presented, and reactions or decisions made have been illustrated. Now, a few of the strengths and weaknesses of such a system are presented.

Strengths perceived by Kansas personnel of the higher education system are the following:

1. The system obtains strengths of many people in data collection and decision-making;
2. Intra- as well as inter-institutional analyses can be made;
3. An excellent check and balance network was developed by one's own professional body; and,
4. The system has local institutional involvement in decision-making.

Some of the perceived weaknesses are:

1. It is time consuming and expensive;
2. A majority of the personnel must subscribe to the notion that the data collection and decision-making effort is worthwhile to improve the present system;
3. It is difficult to refine decisions made previously; and
4. Almost everyone must see "success" in his or her own institution "benefit" or the system has many rought spots.

As to what all the past means for the future in the Kansas system would only be conjecture. As of this date the system has worked with a great deal of success and there have been fruitful moments. There have been, however, frustrations and friction. Perhaps the most important element of the present network is that the success is more to the nature of the people than the system. It was not a planned system as much as an evolutionary process. Influences from other states and other operations have influenced our efforts, but a real cooperative exertion of energy for comparative data and an earnest notion to improve one's state of functioning have, no doubt, been the main strengths of this Kansas structure.

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LONG-RANGE PHYSICAL PLANNING IN KANSAS

George M. Platt
Wichita State University

In 1969 the Kansas Board of Regents, some of the college and university presidents, and the facilities officer of the Board staff—an architect—became interested in establishing a coordinated basis for long-range physical planning among the six state institutions. Out of this interest grew a state-wide Long-Range Physical Planning Committee (LRPPC) charged with developing a process for long-range physical planning which each campus could follow in developing its own physical development plan. It is my purpose to briefly outline this planning process and to describe its relationship to—and dependence upon—the development of comparable data elements at the six institutions.

It is important to note that long-range physical planning in Kansas was born—at least when compared to state-wide institutional research or academic planning—with a silver spoon in its mouth, a half-million dollar silver spoon in terms of funds provided by the legislature to get things going. The reason, as I am sure most of you realize, was a direct result of the fact that problems related to buildings, streets, sidewalks, traffic, and empty dormitories are very real, cast in concrete and brick, and legislators can understand them. In addition, Kansas, like other states, had reached the point where requests for physical facilities could no longer be based on the statement: "But we need it."

The Long-Range Physical Planning Committee, with the assistance of the consulting firm of Caudill-Rowlett-Scott, spent a year—1970-71—developing a process, a plan for planning. Out of that year, which included lots of bloodletting, came a process spelled out in several hundred pages, the *Physical Development Planning Manual*. The *Manual* outlines a method that (a) requires each campus to collect certain kinds of data in the same way, but (b) allows each to preserve its individuality in growth.

The component of physical planning of perhaps most interest to this conference is our method of determining space needs. The *Manual* contains formulae for determining space needs based on Weekly Student Contact Hours, FTE students, HC students, and number of individuals requiring office or research space. We organize the data in two ways: First we classify both existing space and space needs using the NICHEMS Program Classification Structure, which allows comparison among institutions. Second we classify both existing space and needs according to the organization structure found on each campus. These data were first collected for Fall 1971 when we compared existing space and needed space and projected needs for 1980. We are now in the middle of our first major update, identifying existing and needed space for Fall 1974 and projecting needs for 1984. Existing space is inventoried following the procedures outlined by the USOE in their *Higher Education Facilities and Classification Manual*.

Let me briefly describe our process for determining space needs. In the area of instruction (1.0), classroom and laboratory space needs result from "guideline values" applied to Weekly Student Contact Hours (WSCH). These "guideline values" provide a means of assigning Net Assignable Square Feet (NASF) for each WSCH. Figure 1 shows a typical page from the *Manual* with space values for instructional program categories. For classrooms, the factor is 1 NASF for each WSCH. For laboratories the factor varies, depending on (a) whether the WSCH is undergraduate lower division or advanced work, and (b) the discipline. It is important to remember that this procedure is dependent upon a common course numbering system followed by all six institutions which identifies the HEGIS discipline, the department offering the course, the type of course, and the level of each course. Office and office support space is generated by a ratio of 200 NASF for each person requiring office space. This produces faculty offices, departmental areas, conference rooms, workrooms, and storage space.

Research space is generated by a formula where guideline values vary according to discipline, and public service space is based on office needs. In the area of academic support, special formulae exist for such activities as computer centers, audio-visual facilities, and libraries. Institutional support and student services needs are generated in a somewhat different fashion. In the first case, each FTE student produces a need for 9 NASF for offices, physical plant, and logistics. In the second, each headcount student generates a need for 14.5 NASF which includes all student-oriented activities with the exception of dormitories, food service, health services, and intercollegiate athletics.

Of equal importance to the state and the institutions, but perhaps of less interest here, are all of the other components of the physical planning process which I will not discuss in detail—assessment of building condition, inventory of space by room type, determination of utility needs, open space considerations, traffic and parking, etc. During these activities we utilized the techniques of land use planning and developed conceptual proposals for using space. Figure 2, the traffic concept for Wichita State University, is an example. We continued, of course, to utilize institutional research skills for such assignments as determining the physical location of students, faculty, and staff during critical hours of the day, data needed in traffic and building site studies.

The end result for each campus is a physical development plan presented with its supporting data in a *Physical Development Planning Workbook*. Figure 3 shows that plan for Wichita State. We also carried our planning beyond the campus at Wichita State to include the surrounding area.

We have found these plans most useful because they

Figure 1

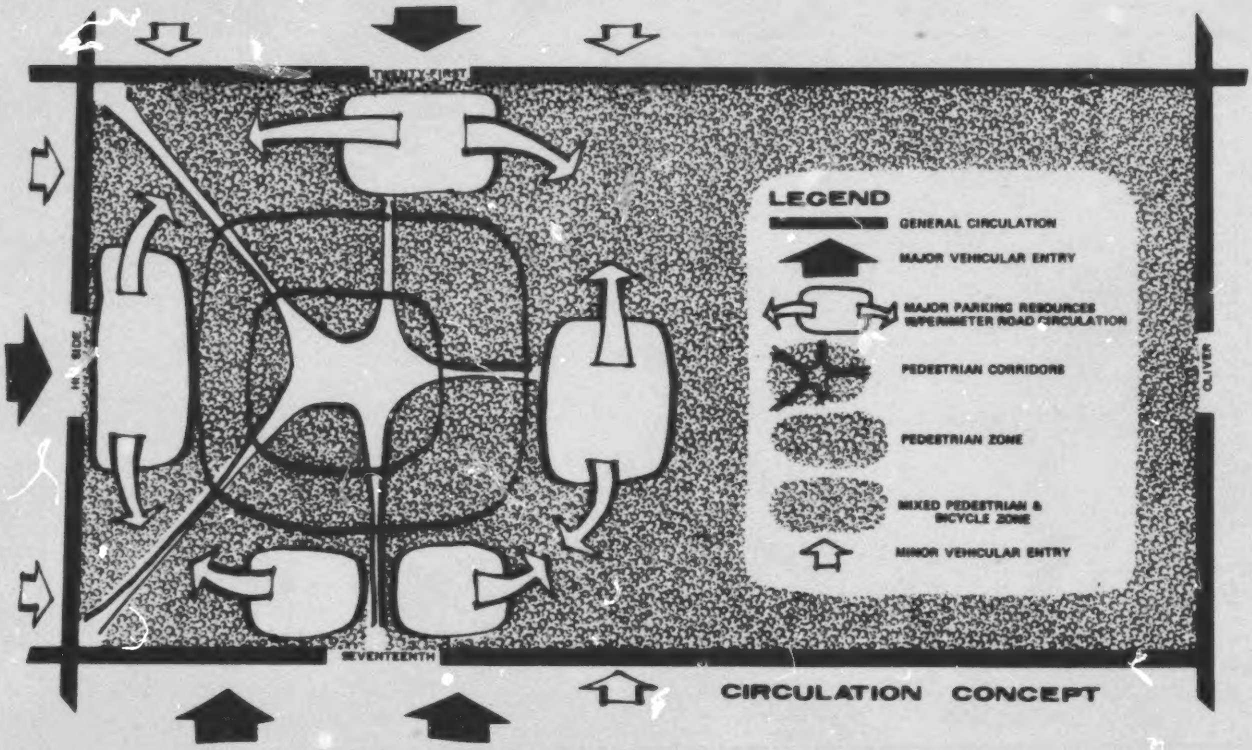
PCS Program Category (or other PCS Level as shown)		Guideline Value, NASF per ACTIVITY LOAD UNIT (UNLESS EXPRESSED OTHERWISE)									
Room Type Series Nbr. and Name		100 Classroom Facilities	200 Laboratory Facilities (not incl. 250, 255)	Research Laboratory Types 250, 255	300 Office Facilities	400 Study Facilities	500 Special Use Facilities	600 General Use Facilities	700 Supporting Facilities	800 Medical Care Facilities	900 Residence Facilities
Activity Load Unit		Lecture WSH	Lab WSH		FTE Staff Requiring Office Sp.						
11	GENERAL ACADEMIC INSTRUCTION (Guideline applies to all program categories).	1.0		▨	170	* 30 NASF per office space	FTE staff requiring	*	▨	▨	▨
1101	AGRICULTURE AND NATURAL RESOURCES		3.4	▨			▨		▨	▨	▨
1102	ARCHITECTURE AND ENVIRONMENTAL DESIGN		4.7 (L) 9.4 (U)	▨			▨		▨	▨	▨
1103	AREA STUDIES		1.6	▨			▨		▨	▨	▨
1104	BIOLOGICAL SCIENCES		3.1 (L) 9.5 (U)	▨			▨		▨	▨	▨
1105	BUSINESS AND MANAGEMENT		1.6	▨			▨		▨	▨	▨
1106	COMMUNICATIONS		2.. (L). 6.3 (L)	▨			▨		▨	▨	▨
1107	COMPUTER AND INFORMATION SCIENCES		1.6	▨			▨		▨	▨	▨
1108	EDUCATION		2.1	▨			▨		▨	▨	▨
110839	Indust. Educ.		10.4								
110835	PHYSICAL EDUCATION		6.3 (U)	▨			13.0 (L) per P.E. Lab WSH		▨	▨	▨
1109	ENGINEERING		3.6 (L) 10.4 (U)	▨			▨		▨	▨	▨
1110	FINE AND APPLIED ARTS		4.7 (L) 9.4 (U)	▨	210 Off. studio		▨		▨	▨	▨

organize our thinking and help us make day-to-day decisions. They also help us make our case before city planning departments, alumni, deans and faculty, legislators, neighborhood citizen organizations, and any number of other interested groups. I make this point because there exists a school of thought among university planners that such concepts as our development plan are out of date, the legacy of all the evils of the old-fashioned city master plans which collect dust in so many city halls. In fact, at the annual meeting of the Society of College and University Planning held last summer in Denver, one of the members, from the University of Chicago, held such efforts in contempt. He alternated slides of campus plans, including the one for my institution which you have just seen, with pictures of children building sand castles at the beach. As you people might expect, his presentation was notable for its lack of data. Perhaps it is true that the University of Chicago no longer needs a development plan, but those of us who are still experiencing rapid growth and who must work with city and state agencies to solve sewer, traffic, and housing problems find it rather comforting to have considered at least a few of the alternatives before we are forced to argue a case before municipal planning commissions and city councils.

Physical planning in Kansas is by no means a model for the nation, yet we have come a long way in five years and we think we are on the right track. Time does not permit a more detailed look at our progress, but it might be useful to conclude by identifying a few of the problem areas which we have encountered:

1. *The general validity of our data concerning space needs.* We are constantly at work refining our method for identifying space needs, and we know that it has problems. I am fairly confident that our broad-based needs are fairly accurate and defensible by means other than our formulae. For example, classroom, instructional laboratory, and office needs for the campus are probably realistic, but when one moves to small departments, it is impossible to account for individual differences with formulae. The same is true with projections, which are probably good for the university but poor for the 5-man religion department.
2. *Formulae for academic and institutional support activities.* While we are fairly confident that our formulae for generating laboratory, classroom, and office needs are supported by national standards and allow for differences among institutions, we are

Figure 2



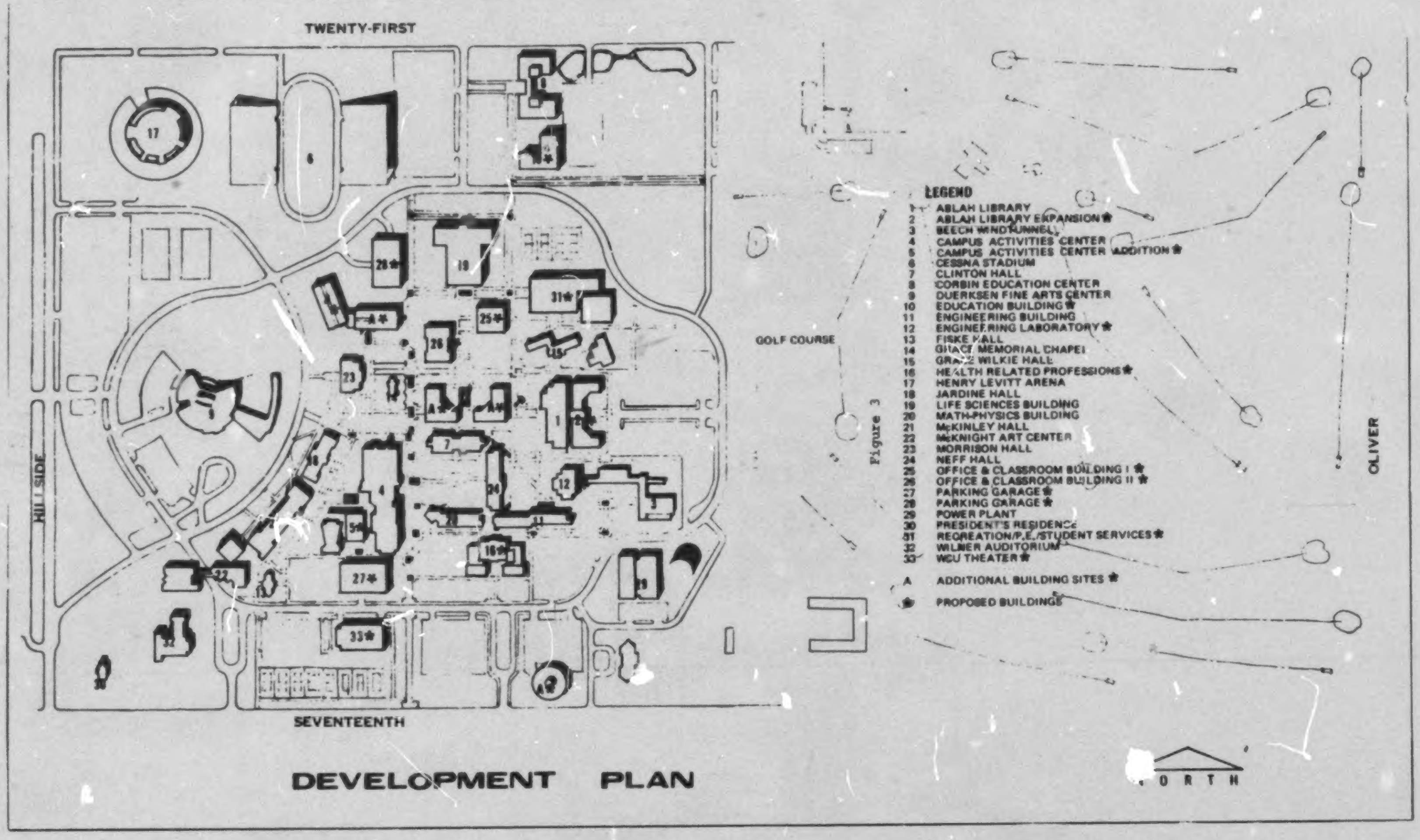
CIRCULATION CONCEPT

not as confident about those for some of the academic and institutional support areas. Libraries and audio-visual centers are a problem, and we are working in these areas to develop methods that will better distinguish between the needs of large, research oriented universities and colleges with undergraduate teaching as a primary mission.

3. *Research space.* Although existing research space needs are fairly easy to ascertain, it is difficult, if not impossible, to identify research space needs for five or ten years in the future. In addition, we are not completely clear in our own minds concerning what constitutes research space. Can it be partly instructional? How is it measured in fields like agriculture and education?
4. *Enrollment projections.* If our plans are to have the intended impact on governing bodies, we have to have a measure of credibility for our enrollment projections. We have not, however, settled on a common approach, and each institution prepares its own projections. It is obvious that they are high, our financing model in Kansas is geared to growth, and we will have to come to grips with this problem in the immediate future.
5. *Weekly Student Contact Hours.* Most of our campuses are in a position to accurately collect WSCH based on start-stop time for regularly scheduled classes. We run into a problem with unscheduled courses and those which carry variable credit. We are studying the problem and would welcome suggestions.
6. *Communication.* We have experienced the usual problems with communication on each campus between those concerned with physical planning and those concerned with academic planning and institutional data. This problem has been minimized through several joint meetings between institutional research and physical planning committees and because one individual represents his campus on both committees.
7. *The complexity of the physical planning system.* I am not joined by all of my colleagues on LRPPC in this conclusion, but in my opinion our system is too complex—perhaps too sophisticated—for our present stage of institutional expertise. I think we would be better off with a *Manual* half the size, and a process that is more limited in scope. Those who disagree argue that we have a system that will allow us to grow in sophistication and that we need not utilize all of the fine points at the beginning.

These are problems, however, which the Committee and the institutions feel they can tolerate. We have a logical basis for determining space needs. We have a method for dealing with campus change and growth, and, in our opinion, we have a method that can adjust to new ideas and our increased expertise with the art and science of planning.

Figure 3


TWENTY-FIRST
SEVENTEENTH
HILLSIDE
OLIVER
GOLF COURSE
Figure 3
LEGEND
1 ABLAH LIBRARY
2 ABLAH LIBRARY EXPANSION ★
3 BEECH WINDTUNNEL
4 CAMPUS ACTIVITIES CENTER
5 CAMPUS ACTIVITIES CENTER ADDITION ★
6 CESSNA STADIUM
7 CLINTON HALL
8 CORBIN EDUCATION CENTER
9 DUERKSEN FINE ARTS CENTER
10 EDUCATION BUILDING ★
11 ENGINEERING BUILDING
12 ENGINEERING LABORATORY ★
13 FISKE HALL
14 GRACE MEMORIAL CHAPEL
15 GRACE WILKIE HALL
16 HEALTH RELATED PROFESSIONS ★
17 HENRY LEVITT ARENA
18 JARDINE HALL
19 LIFE SCIENCES BUILDING
20 MATH-PHYSICS BUILDING
21 McKINLEY HALL
22 McKNIGHT ART CENTER
23 MORRISON HALL
24 NEFF HALL
25 OFFICE & CLASSROOM BUILDING I ★
26 OFFICE & CLASSROOM BUILDING II ★
27 PARKING GARAGE ★
28 PARKING GARAGE ★
29 POWER PLANT
30 PRESIDENT'S RESIDENCE
31 RECREATION/P.E./STUDENT SERVICES ★
32 WILNER AUDITORIUM
33 WSU THEATER ★
A ADDITIONAL BUILDING SITES ★
★ PROPOSED BUILDINGS
NORTH
DEVELOPMENT PLAN

FACULTY ACTIVITY IN KANSAS

Donald H. Tarrant,
Kansas State University

The legislature that assembled at the State House in Topeka, Kansas in January 1971 expressed no open hostility toward the faculties and staffs at the six Kansas Regents institutions of higher learning. During the 90-day legislative session no serious confrontations developed between the lawmakers and higher education. Yet, at adjournment, the legislature funded the institutions at the previous year's level with salaries and wages for all employees frozen at the 1970-71 school year amount. All of this transpired with a surplus of monies in the state coffers. Political maneuvering in the final session days, along with increased demands for welfare monies, highway funds, etc., had successfully blocked the meeting of any increased needs for state supported higher education. In addition, it became vividly clear that the elected lawmakers were convinced that personnel in the colleges and universities were relatively better off in terms of what they thought they were doing and these elected officials felt that their publics' best interests would best be served by ignoring the request for increased funding and, in particular, of denying salary adjustments. In the months that followed, it became increasingly clear that higher education in Kansas was faced with the task of communicating to the public, as well as the legislative bodies of the state, the credibility of Kansas higher education and the need to support with tax dollars the resource requirements of the state institutions of higher learning.

While each of the six institutions that make up the Kansas Regent Group had done some dabbling with descriptive data on their faculty, there existed no Regent-wide effort nor basis for piecing together an answer to the descriptive question of "What do they do?" To be sure, there existed many who could generalize on the role of faculty and staff, but even those charged with the responsibility of administering directly to this group could not communicate with any assurance of specific understanding the activities and work effort that made up the appointments on the six campuses. In a nutshell, the work effort of faculty and staff could not be described quantitatively.

The Council of Chief Academic Officers requested that the Institutional Research Officers of the Regents institutions develop a common instrument to measure the quantitative aspects of faculty activity at the institutions. The statewide study was conducted in late 1971 using a common survey form and compiled using centralized computer processing. This initial study included all unclassified personnel employed at the six Kansas institutions. The term "unclassified personnel" included graduate research assistants, central administrative personnel, extension personnel, and various other types of non-instructional personnel in addition to the teaching faculty. The results of the 1971 study were summarized in the Kansas Board of Regents widely-distributed publication, *Guidelines for Increasing Academic Efficiency at the State Colleges and Universities.* Included among those results were the following:

1. Large differences in unit costs occurred among academic disciplines.
2. Approximately three-fourths of the time reported by the unclassified personnel at a majority of the institutions was directly related to instructional activities.
3. Average student credit hour costs were lowest for freshmen-sophomore courses and highest for doctoral courses.
4. The average number of hours per week reported for all activities by the respondents ranged from approximately 53 to about 60 with the median being approximately 56 hours per week.

The 1971 statewide faculty activity study provided useful information for a variety of statewide and institutional purposes. Additionally, it provoked some unrest (and unkind words) where it differed from the conventional budgetary estimates of workload. Following the publishing of the survey, it became apparent that a second study would be necessary. Several reasons were cited for conducting the follow-on exhaustive faculty workload study for the six Kansas institutions of higher education. One, it was felt that a subsequent study should be undertaken to verify the accuracy of the workload patterns determined in the 1971 study. Second, there was a need to express faculty workload employing a wider variety of measures. Third, and as a result of major changes made by the institutions in standard course numbering, a new study would permit more meaningful inter-institutional comparisons within similar academic disciplines. Fourth and final, there was a desire to follow the procedures developed by the National Center for Higher Education Management Systems (NCHEMS) in the faculty activity area to allow comparison of workload data with institutions outside the Kansas Board of Regents' jurisdiction.

After much deliberation and consultation the NCHEMS survey form was adopted and modified to adapt it for use by the six institutions. Six basic summary displays were hammered out to depict institutional activity at three levels (department, college, all-campus). We arranged some rather specific times of collecting data and attempted to formulate rather rigid rules for deriving the masses of information that were to be displayed. A comprehensive computer-based edit program was created along with the output routines. Capture of the data in a machine processable form was the responsibility of each campus with the edit and output processing completed on a single campus (in the interest of economy and standardization).

After surveying some 7,211 full- and part-time unclassified employees on the six campuses, after cranking out over 2,500 pages of computer printout with respect to these faculty and staff, we have (in a gross sense) concluded as follows:

1. The overall workload patterns of unclassified employees is remarkably similar to the patterns revealed in the 1971 study.
2. The typical unclassified employee reported that he worked approximately the same number of hours per week shown in the 1971 study (and as shown in similar studies conducted throughout the country).
3. Large differences in instructional workloads and faculty salary costs per student credit hour occur among levels of instruction.
4. Large differences in instructional workloads and faculty salary cost per student credit hour occur among academic disciplines.
5. There are larger differences in instructional workloads and in faculty salary costs per student credit hour among academic disciplines within an institution than among institutions.
6. The number of student credit hours "produced" per full-time equivalent instructional position (and consequently the student-faculty ratio) is greater than revealed by the 1971 study.
7. An instructional faculty member spends approximately two hours in tasks directly associated with his teaching assignment (preparing lectures, setting up laboratory experiments, constructing and grading examinations, etc.) for each hour he spends in formal contact with students in teaching situations.

In addition, the study revealed that the typical unclassified employee at the six Kansas colleges and universities spent 36.5 hours per week on instructional duties, 5.5 hours on sponsored research activities, 4.6 hours on service activities, and 9.1 hours per week on various management tasks. I could go on and on revealing some of the interesting and uninteresting bits of information that we have uncovered in the state of Kansas with respect to those who function in six of the colleges and universities. In a nutshell we have learned much in terms of quantifiable data, but little in terms of data that could be labeled, even loosely, significant or surprising.

The fact that our study of Kansas faculty and staff revealed neither significant nor surprising data is perhaps most significant—for it speaks eloquently to label as fraud those who attempt to describe higher education and personnel activity by simplistic formula or who are content to wave a single or several data elements before the public as descriptive of higher education institutions and those employed within higher education. Our studies of only faculty and staff point out vividly that the higher educational process is extremely complex and full of cautions with respect to making generalizations about the process.

Let me now briefly offer some observations as to what this "joint venture" of measuring faculty activity among Regents institutions in Kansas spells out in terms of weaknesses (costs) and strengths (payoffs). First the negative aspects:

1. Compromise is often difficult and sometimes upsetting. So it was with measuring faculty activity for our institutions. For you see we are all funded from a common source, Kansas tax revenues. Since we in some ways compete for funding, it follows that studies that display common data side by side provoke (on occasion) some bickering and skepticism, if not outright distrust. It is difficult for research types to deal with political considerations and our approach has been one of attempting to control and minimize the political. The elimination of the political seems not possible in the real world.
2. A second weakness of our faculty study is that the published study provides a ready source for introducing comparative analysis when such analysis is ill advised. That is, bottom line comparisons are often easier to suggest than value judgments that require a deep look at the portions that precede the bottom line. Thus, as often we suspect, our data is voiced in support or in opposition when neither is appropriate in terms of the study.
3. Another weakness is that measurements of this type (no matter how well intended or necessary) provoke an intensification of the faculty-administration "cold war." Doubtless this is not a general criticism, but it does have merit in terms of clusters of faculty who resent any "test tube" exercise into what they are doing. These faculty members insist that this type of research is an infringement on their freedom and reflects a basic "administration type" distrust of those who carry the major share of work.
4. Lastly, in terms of the negative, these multi-institutional surveys in depth are very costly in terms of time and energy. The countless hours of discussing rules, definitions, timings, responsibilities, etc., often mask out the ore that ultimately pours from the printer. This is indeed a very expensive way to take a picture that is devoid of any qualitative perspective. This lack of the qualitative aspect is often voiced as the most pronounced weakness.

I would not want to leave this topic with emphasis on the negative and, thus, I have chosen to conclude by citing several strong points but, by no means, all of the strengths. At Kansas State University, it is very difficult to predict the use of the faculty survey data other than to know that it almost daily is subjected to responding to questions or decision search. In terms of the more gross and systemwide advantages let me cite three:

1. The study provides a highly viable source for supporting differences in institutional mission and the variable costs associated with these missions. In this period of funding difficulty it would seem basic that research should (must) be undertaken that would provide cost differentials to both the fund management source and those responsible for operational management. In addition to mission differential costs, the study provides an abundance of data highlighting the cost differential that exists between levels of instruction, as well as those cost differentials that exist between disciplines.
2. Faculty activity data has in Kansas provided a sound mechanism for supporting the comprehensiveness and complexity of institutions of higher education. The degree to which it has rendered us "accountable" I am unaware, but I am very much aware of the softening of those voices that, until recently, accused and always questioned. While there are doubtless many variables at play the "zip" in salary raise money we received in January 1971 has been replaced with rather handsome increases since then, as well as public statements by high authority

of the dedication to the proposition that faculty salaries for those associated with higher education in Kansas will not suffer as they have in recent years. We in IRP would like to feel that this change in attitude is, in part, due to the efforts in producing system-wide faculty activity information and the communicating of this information to all concerned.

3. Our study of institutional unclassified personnel has provided us and our Regent office with a sound platform for describing the faculty resource need in terms of a variety of allocation models or processes employed in planning and budgeting. It has tended to eliminate the need for guessing or generalizing and affords a reliable and stable mechanism when there is a need for data with respect to this most costly of all resources in the higher educational process.

With that I will quit—knowing that one cannot possibly communicate adequately the frustrations, the problems, the achievements of measuring people activity in such a short presentation. Hopefully you can appreciate the fact that institutions that are component parts of statewide systems are compelled by the times to join forces in terms of common interests but that each institution must pay a price for the joining.

FROM POLICY TO IMPLEMENTATION: A PROBLEM SOLVING APPROACH TO AFFIRMATIVE ACTION

Denise Strenglein,
University of South Florida

The initial steps toward affirmative action remind me of the old story about the mule trainer who used to always start off by clouting the mule over the head with a two-by-four. He said the "first thing you always gotta do is to attract the animal's attention." Getting the attention of policymakers sometimes seems to fall in the same category.

At the University of South Florida, as early as 1968, formal documentation had been compiled to show enough evidence of discrimination against women to warrant a full scale investigation. It was not until 1971, however, that such an investigation was undertaken. In that year the then new president of USF, Cecil Mackey, appointed a committee to investigate the status of women at USF.

Right from the beginning we had some problems with the acronym attached to the name Status of Women. One chivalrous soul suggested we change the name to Committee on Women. I hit him with the Affirmative Action Plan.

Similar activism was occurring at other state institutions. Where administrators refused to take action, suits were filed.

Affirmative action for minorities had an earlier start. USF's first Affirmative Action Plan was published in 1969, prompted no doubt by the black activism of the 60's.

Beginning in the spring of 1971 the Status of Women committee embarked on a six month program of institutional research studies. Investigations were made of workload, salaries, promotions, and perceptions of attitudes and atmosphere. Individual case studies were assembled tracing the careers of certain faculty women who felt they had not been given equal opportunity.

Salary Studies

A salary and rank study was made which compared a sample of women faculty with their closest male counterparts (Kimmel, 1971.) Earlier studies had shown clearly that women were paid less than men but it often was asserted that, in general, women are paid less and promoted more slowly not because they are women but because they are not as well-trained, have not had the same amount of experience, or are less productive than the men with whom they work. In an attempt to isolate sex as an independent variable the counterpart study focused on full-time faculty women with Ph.D. degrees. One group of male counterparts was chosen by nomination by the women themselves. In order to reduce bias, a second nomination was made by the chairmen of the departments in which the women worked. The study first showed that the two groups were indeed matched on the following criteria:

> Training and Employment Status: All were full-time. All the women and all but two of the men had Ph.Ds.
>
> Experience: Number of years since terminal degree was the variable used. T-tests demonstrated that when the years of experience of the two male samples were averaged, the men and women were closely matched.
>
> Productivity. Research data sheets summarizing scholarly productivity were prepared. Some of the factors considered were grantsmanship both past and present, numbers and types of publications, degrees, and knowledge of foreign languages.

A point system was devised and productivity points compared. The women's sample was again not significantly different from the average of the two male samples. Thus, the two groups were demonstrated to be similar in experience, training, and productivity. The study then examined salary and rank factors. Here there were significant differences. The women's salaries were lower than their male counterparts and the women were more often in lower ranks.

A separate analysis was made which used available faculty effort report data to compare workload patterns of the people in the counterpart samples (Strenglein, 1971). It was concluded that the women in the sample did more teaching and at a lower level than the men, that they were less involved in administration, but that there was not a significant difference in research activity.

Another type of salary study uses multiple linear regression. Loeb and Ferber (1971), Wilson (1971), Astin and Bayer (1972), Katz (1973), and Prather and Smith (1974) have used this method to predict salary based on such factors as discipline, degree, experience, administrative position, sex, and race. Among the advantages of this technique are that it allows for a large number of variables to be taken into consideration and that it avoids what some faculty may feel are odious comparisons of individual accomplishments (Prather & Smith, 1974, p. 4). Regression analysis provides a prediction of statistically normal salary levels based upon historical data. If sex bias does indeed affect salary, then the built-in inequities are likely to be perpetuated. I suggest that counterpart analysis be used to first adjust salary scales, then regression can be used as a monitoring instrument.

Survey of Perceptions of Sex Bias

Another Status of Women subcommittee made an extensive survey which helped describe the female faculty population and to uncover their perceptions of their working environment. The survey took descriptive measures including whether or not the women were the only (or were the major) family wage earners. It is notable that 55% were. The survey asked about work assignments, both actual and desired, promotion and raise criteria, and so forth. The final section dealt with women's perceptions of prevailing male attitudes toward women.

Figure 1

RESEARCH DATA SUMMARY

Dept/Div/Coll:

NAME
Last First Mi

	Col(s)	Code	Prior to USF Appointments	Tot Fwd	68	69	70	71	72
FIXED	1-9		Social Security Number						
DATA	10		Rsch. Grants						
	11		Bks, Wkbks, Monogs.						
	12-13		Articles, Chaps.						
	14		Awards, Honors						
	15		Yrs. Tchg. Exp.						
	16		Yrs. Prof. Non-Tchg. Exp.						
	17-18		Previous Occup/Location						
	19		# Prior Tchg. Pos's.						
	20		# Prior Prof. Non-Tchg. Pos's.						
	21		Foreign Languages, Read and Write						
	22		Foreign Languages, Speak						
VARIABLE DATA	23		Terminal Degree						
	24,25,26		Conferring Inst.						
	27-28		Date Degree Conferred						
	29,30,31		Field of Terminal Degree						
	32		Certificates, Licenses, etc.						
ANNUAL REPORT DATA									
CURRENT DATA	33		Current Org. Membshp--Nat'l & Reg'l						
	34		Current Org. Membshp--State & Local						
	35		Current Membshp USF & Univ System						
CUM. FROM DATE OF EMPLOY. (CODED)	36-37		# Speeches given Lay						
			Prof						
			Total						
	38-39		# Bks, Wkbks.						
	40-41		# Articles, Chaps.						
	42		# Book Reviews						
	43		# Grants Rec'd.						
	44		Advanced Training						
	45		# Performances, Exhibits						
	46		# Awards, Prizes						
	47		Other Scholarly Actvs.						
	48		Spouse: College Degree/Advanced Trng.						
	49		Spouse: Tchg. Qualifs.						
	50		# Children						
	51-52		Termination: Reason						
	53-54		Nature and Location of new position						
	(uncoded)		(Current Rsch. Projects						

A slightly edited version of the same survey was sent to our male counterpart sample. A comparison of responses from the two surveys showed certain perceptual differences. For example, note the results on the following question.

QUESTION: How would you characterize the attitude of your male colleagues toward women in the profession?

1. The feel that women are more likely to be productive in their jobs than men.
2. They feel that women are as likely to be productive in their jobs as men.
3. They feel that women are somewhat less likely to be productive in their jobs as men.
4. They feel that women are almost never as productive in their jobs as men.

RESPONSE:	Women (%)	Men (%)
1. more likely	1	0
2. as likely	44	63
3. somewhat less likely	44	32
4. almost never as	11	5

When the question was rephrased for the men from "attitude of your male colleagues" to "your attitude" the men's percentages change to

1. more likely	0
2. as likely	86
3. somewhat less likely	10
4. almost never as	5

Prejudice is notoriously hard to detect in oneself. A similar survey of non-faculty women staff members was made. The questionnaire used was similar in intent, but directed toward the concerns of the women in secretarial, clerical, and custodial positions.

The conclusions reached pointed to the existence of at least perceived discrimination against women. The results of these studies were assembled. These, together with a point-by-point list of areas of concern, were sent to President Mackey in February 1972. This report, which was called "Proposal for an Affirmative Action Plan for Women at the University of South Florida" (1972) was the Status of Women Committee's two-by-four.

Implementation of Affirmative Action Proposals

The fact that we had indeed gained attention was evidenced by the President's thoughtful and detailed reply, as well as by implementation of a number of the women's proposals.

In the Fall of '72 salary equalizations for women faculty were effected and a number of deserving women were promoted. Interestingly, at the same time certain salary inequities among male faculty which had been uncovered in the course of the investigation were also adjusted.

Another recommendation more-or-less implemented concerned the establishment of a position for a Special Assistant for Women's Affairs. This person would initiate, coordinate, and promulgate research studies, participate in grievance procedures in matters of sex discrimination, and generally aid in the implementation of affirmative action. The proposal indicated that the person should answer to the President. Dr. Mackey's response was to create two such positions, each answering to a Vice President.

I am having second thoughts now about the advisability of having the Equal Opportunity (EO) Officer answerable to any university official. If EO officers do their work too well, it is only a matter of time before they find themselves in an adversary role vis a vis people who have the power to dismiss them. USF has lost two Special Assistants for Women's Affairs in three years, one of whom was forced from her position. In Florida the university auditors answer directly to the Auditor General's office in the state capitol. No one on campus can silence a pesky auditor. Perhaps some such arrangement should be considered for EO specialists.

Currently USF has Equal Opportunity specialists in student, faculty and non-faculty staff areas. The Status of Women committee is still active in an advisory capacity and there is an Equal Opportunity Committee which also advises the president. A young man on the president's staff coordinates equal opportunity activities as part of his other duties.

The voices of the women at USF joined those from other state universities. The state nepotism rules had long denied the wives of male faculty members an opportunity to enter the tenure earning ranks, thus effectively blocking these professional women from career advancement. The rules were modified at the state level in 1972 so that this is no longer the case.

Another recommendation, since implemented, was the establishment of a Women's Study program. USF has also had an Afro-American studies program for a number of years.

A Women's Center and a Black Student Union both have space on campus. These organizations provide various non-financial support services including social activities and referral services. This kind of support was also called for in the proposal.

Data Needs

It became obvious during the course of these investigations and subsequent ones by the University administration that our existing data was not adequate to support compliance monitoring activities. The solution was to provide computer listings of the Equal Opportunity information available in personnel records. Researchers can now get Equal Opportunity information on computer runs sorted by rank, by sex, by race, by department, by job classification, and by many combinations of the above.

Termination listings are available which show who left and why.

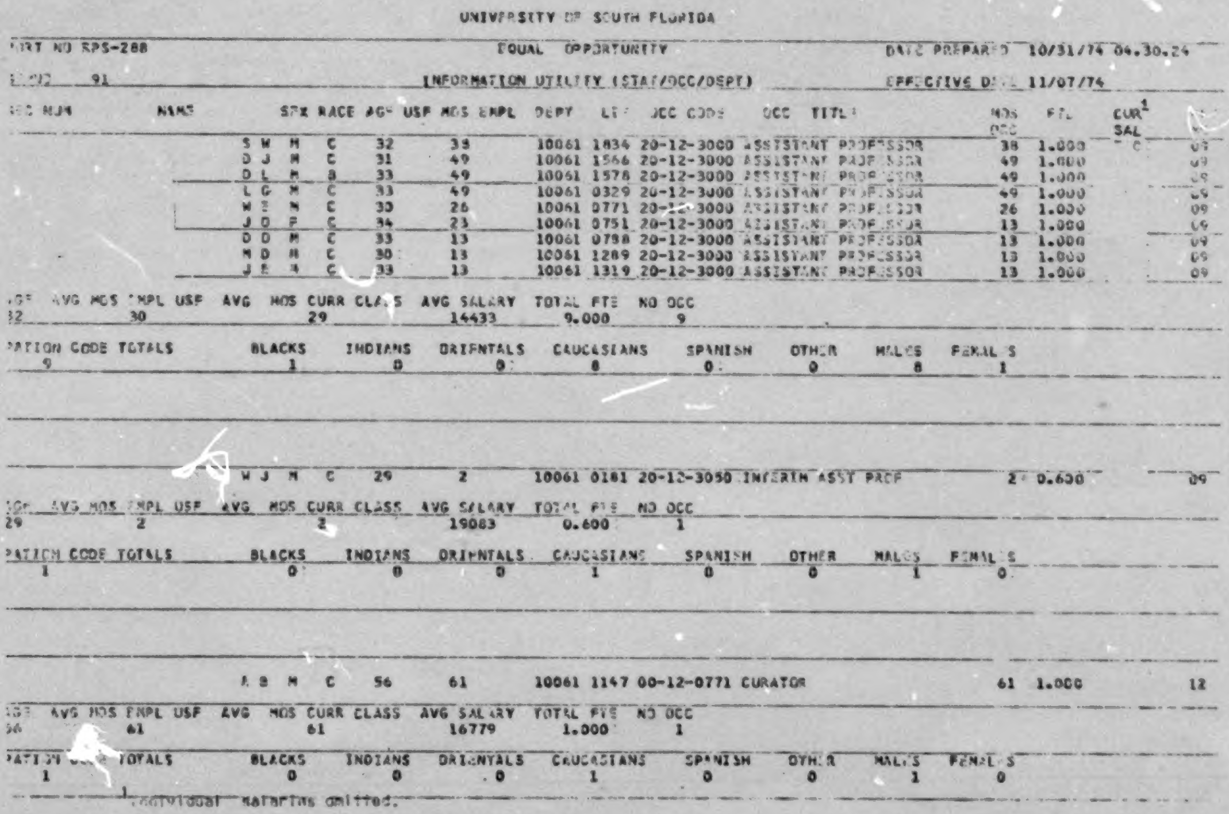
The success of an Equal Opportunity program requires vigilance. It is very easy to lose ground, as we found out this year. The counterpart salary study of 1972 was updated (Dickey, 1974), and slippage had occurred. The latest study showed that the women's salaries have increased more slowly than the men's. Some of the women in the sample received promotions, but more of the men did. Some of the women left only to be replaced by men. Other studies, from different viewpoints, all told the same story.

The administration again responded. Each college was ordered to examine its faculty salary structure. Where women's salaries were found to lag behind those of men with equivalent experience, training, and productivity, adjustments were again made.

Affirmative Action Plan

A discussion of affirmative action is not complete without a discussion of the Affirmative Action Plan itself. Groomes (1972) has published a booklet that very succinctly enunciates the components of a good Affirmative Action Program.

Figure 2



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                                         UNIVERSITY OF SOUTH FLORIDA
RT NO RPS-288                                 EQUAL  OPPORTUNITY                        DATE PREPARED  10/31/74 04.30.24
     91                                  INFORMATION UTILITY (STAT/OCC/DEPT)            EFFECTIVE DATE  11/07/74
SOC NUM          NAME        SEX RACE AGE USF MOS EMPL  DEPT   LINE  OCC CODE    OCC  TITLE          MOS    FTE     CUR1
                                                                                                     OCC            SAL
                             S W  M    C    32     38       10061 1834 20-12-3000 ASSISTANT PROFESSOR   38  1.000      C      09
                             D J  M    C    31     49       10061 1566 20-12-3000 ASSISTANT PROFESSOR   49  1.000             09
                             D L  M    B    33     49       10061 1578 20-12-3000 ASSISTANT PROFESSOR   49  1.000             09
                             L G  M    C    33     49       10061 0329 20-12-3000 ASSISTANT PROFESSOR   49  1.000             09
                             W E  M    C    30     26       10061 0771 20-12-3000 ASSISTANT PROFESSOR   26  1.000             09
                             J D  F    C    34     23       10061 0751 20-12-3000 ASSISTANT PROFESSOR   13  1.000             09
                             D D  M    C    33     13       10061 0798 20-12-3000 ASSISTANT PROFESSOR   13  1.000             09
                             M D  M    C    30     13       10061 1289 20-12-3000 ASSISTANT PROFESSOR   13  1.000             09
                             J E  M    C    33     13       10061 1319 20-12-3000 ASSISTANT PROFESSOR   13  1.000             09
AGE  AVG MOS EMPL USF  AVG  MOS CURR CLASS  AVG SALARY  TOTAL FTE  NO OCC
32        30                    29              14433       9.000       9
ATION CODE TOTALS         BLACKS    INDIANS   ORIENTALS   CAUCASIANS    SPANISH    OTHER    MALES    FEMALES
   9                         1         0          0            8           0          0        8        1


                             W J  M    C    29      2       10061 0181 20-12-3050 INTERIM ASST PROF      2  0.600             09
AGE  AVG MOS EMPL USF  AVG  MOS CURR CLASS  AVG SALARY  TOTAL FTE  NO OCC
29        2                     2               19083       0.600       1
ATION CODE TOTALS         BLACKS    INDIANS   ORIENTALS   CAUCASIANS    SPANISH    OTHER    MALES    FEMALES
   1                         0         0          0            1           0          0        1        0


                             A B  M    C    56     61       10061 1147 00-12-0771 CURATOR              61  1.000             12
AGE  AVG MOS EMPL USF  AVG  MOS CURR CLASS  AVG SALARY  TOTAL FTE  NO OCC
56        61                    61              16779       1.000       1
ATION CODE TOTALS         BLACKS    INDIANS   ORIENTALS   CAUCASIANS    SPANISH    OTHER    MALES    FEMALES
   1                         0         0          0            1           0          0        1        0
        1 Individual salaries omitted.
```

These are:

- •POLICY STATEMENT—This should reflect the university's commitment to affirmative action.
- •UTILIZATION ANALYSIS—Present status should be ascertained and problem areas identified.
- •ACTION STEPS OR METHODS OF IMPLEMENTATION—These should be characterized by positive action and results guaranteed.
- •GOALS AND TIMETABLES—The key word is realistic.
- •MONITORING PROCEDURES AND DEVICES—Periodic review of goal attainment is a must.

Utilization analysis is an area of particular interest to institutional researchers. Development of an equal opportunity data system which provides data on training, experience, salary, and promotion by sex within ethnic groupings should have high priority.

At USF each college and each non-college administrative unit was required to set yearly hiring goals over a five-year period. These hiring goals are based on the availability information as analyzed, for the most part, by the equal opportunity specialists. It was even possible to set goals for faculty by academic rank using the rank distribution of male caucasians.

For non-faculty staff regional census data for the Tampa-St. Petersburg Standard Metropolitan Statistical Area provide the basis for determining availability parameters. Goals are set for each of the Equal Employment Opportunity (EEO) categories based on the percentages available in the local work force.

Figure 3

GROSS ESTIMATES OF MINORITY FACULTY AVAILABILITY1974-1979

	Black % (B)	Other Minorities % (OM)	Female % (F)
Total Faculty	4.3	3.3	25
	7.6%		
College of:			
Business Administration	3	2	7
Education	4	2	31
Engineering	3	6	3.5
Fine Arts	5	2	28
Language/Literature	4	3	29
Oedicine	3.5	5.5	
Nursing	6	6	—*
Natural Sciences	2.5	3	7
Social & Behavioral Sciences	5	4	17
Total Non-College Faculty	8.5	4	27

* Already almost 95% female.

Figure 4

GROSS ESTIMATES OF MINORITY STAFF AVAILABILITY 1974-75

	BLACK % (B)		OTHER MINORITY % (OM)	FEMALE % (F)
Total Career Service	11	18%	7	40
E.E.O. Alassification:				
1. Mgrs/Adm	2		6	19
2. Professional	6		6	47
3. Technician	2		6	12
4. Sales	2		6	37
5. Clerical	5		7	75
6. Craftsman	8		7	5
7. Operative	16		11	33
8. Laborers	30		5	11
9. Service	9		6	63
Total A & P	4		6	35
E.E.O. Classification:				
1. Mgrs/Adm	2		6	19
2. Professional	6		6	47

The next area of concern for institutional research is the job of monitoring goals. Everything must be documented. The entire employee flow from recruitment through termination needs to be examined. In any acceptable affirmative action plan problems areas must be identified and solutions set forth. One method found most effective by the USF Status of Women Committee to uncover problem areas was to ask the individuals concerned. Last year women employees and students were invited to a "brown-bag" luncheon conference to discuss women's concerns. The various student and employee subgroups expressed the problems as they perceived them and did some brainstorming concerning solutions. Status of Women Committee members took notes during the discussions. These concerns and recommendations were further discussed, refined, and set in order of priority by subcommittees. A final report documenting the results of these deliberations was sent recently to President Mackey for action. This procedure will probably become an annual event as long as women perceive sex discrimination in their work environment.

Recruitment

In recruitment the "old buddy" system of hiring has been identified as one of the major contributors to the problem of under-utilization of minorities and women. Breaking up this system is an unpopular but necessary task. Seeing that all faculty and administrative openings are advertised in appropriate journals is one of the first steps. The *Chronical for Higher Education* seems to have become the major clearinghouse for such ads.

Gathering statistics on applications and hiring decisions, using search committees with minority and female representation, and keeping permanent files of minority applicants are other effective techniques. Departments must be required to keep positions open long enough for an adequate search to be made. Job titles should have sex stereotypes removed.

In Florida the State University System is in the process of organizing a recruitment and hiring monitoring system. A form which has been developed for reporting openings is currently being field tested. Openings will be advertised throughout the system through a computerized job pool. An equal opportunity profile of the person hired for the job is then fed into the system. With this data available systemwide hiring practices can be analyzed. To enforce use of the system, if a position is found to have been filled without being reported, the offending university will be penalized by loosing one position in that category the following year. Of course, we now have a statewide position freeze due to financial shortfall, but when the economy improves the procedures will be utilized.

Even before the state stepped in, USF had arranged to advertise all local openings in its weekly staff newsletter and to provide up-to-date information on openings readily accessible by phone through Personnel Services. The USF Affirmative Action Plan requires that all applications for faculty positions be kept available for review for one year and that applications from minority people be kept on file permanently to establish a minority applicant pool.

Applicant flow statistics on non-faculty staff are compiled in Personnel. These tell the number of minority and women applicants by EEO category, how their applications were received (that is, through phone inquiry, mail, or interview), the number referred for interview for specific jobs, the number actually hired, the number promoted, the number terminated, the number rejected, and the reasons for rejections. Termination and turnover statistics are also compiled. In these days of no growth the majority of openings occur as a result of turnover rather than as new positions. At USF goals have been based on a no-growth assumption.

Each college department and every other administrative unit is required to have on file a recruitment plan outlining procedures to be followed in hiring. The minimum requirements, as listed in the Affirmative Action plan, are:

- DESCRIPTION OF THE FUNCTIONS PERFORMED BY THE UNIT
- CRITERIA FOR PERSONNEL SELECTION
  This is to include job descriptions and written criteria against which applicant suitability for employment is to be judged. Superfluous educational and other requirements which do not affect job performance are not permitted.
- REQUIREMENTS FOR DOCUMENTATION OF THE RECRUITING EFFORT
  Here the department describes in detail the procedures to be followed in setting salary and rank, soliciting applications, screening and interviewing applicants, and making hiring decisions.

Responsibility

Responsibility for implementation at USF lies ultimately with the President and through him the Vice Presidents—and in turn, with the respective deans, department and division heads, and directors. It falls to the affected constituencies to assure that these officials really do carry out their responsibilities.

Other Affirmative Action Policy Areas

Some other fruitful policy areas for affirmative action are provision of management training and skill upgrading programs accessible to minorities and women. Thought should be given to exposing administrators and supervisors to human relations programs with emphasis on dealing with prejudice. A discussion of equal opportunity and affirmative action should be made an integral part of employee and student orientation. Minority vendors should be encouraged to bid.

I realize that I have not included here a discussion of affirmative action for students. It is a major responsibility of

Figure 5

STATE UNIVERSITY SYSTEM OF FLORIDA POSITION VACANCY ANNOUNCEMENT

PART A (Complete 1 through 12)

1.UNIVERSITY: ☐ BOR ☐ UF ☐ FSU ☐ FAMU ☐ USF ☐ FAU ☐ UWF ☐ FTU ☐ UNF ☐ FIU

2.CATEGORY: (check a, b, or c and complete entire block)

a. ☐ INSTRUCTIONAL & RESEARCH FACULTY

Rank: ____ Code

Codes: 01=Professor 02=Assoc Prof 03=Asst Prof 04=Instructor 05=Other

☐ Academic Administrator

☐ Faculty

☐ Sub-Faculty

☐ Other ________ Indicate

Annual Salary - Rate $________

or Range: $______ (minimum) - $______ (maximum)

Contract Period: ______ months

Tenure Earning Position: ☐ Yes ☐ No

b. ☐ ADMINISTRATIVE & PROFESSIONS Pay Grade: ______ Class Code: ______

c. ☐ CAREER SERVICE (exempt from Wage and Hour Law) Pay Grade: ______ Class Code: ______

3. ________ POSITION TITLE ☐ Check if new position

4.LEGISLATIVE POSITION NO.: ☐☐☐☐☐

5.LOCATION: ________ Division/College Office/Department County (if not main Campus)

6.% FTE: (if less than 1.00) 0.____

7.Description of Qualifications Required:
Required Degrees Yrs Related Experience
____
Other: ________

8.Application Deadline (postmark): ______ Mo.Day Yr.

9.Starting Date: ______ Mo.Day Yr.

10.Recruiting Deadline: ______ Mo.Day Yr.

11.Grant or Contract Position: ☐ Yes ☐ No

☐ Check if vacancy filled from within same office/department. This vacancy will not be announced. (complete Part B)
ALL OTHER VACANCIES MUST BE ANNOUNCED.

12.Person Responsible for Recruitment:
Name
Title Phone No.
Signature

PART B (complete entire section) POSITION FILLED ANNOUNCEMENT

NAME: ________ Last First Middle

SOCIAL SEC. NO.: ☐☐☐-☐☐-☐☐☐☐

☐ Male
☐ Female

☐ White
☐ Black
☐ Spanish surnamed
☐ Asian American
☐ American Indian
☐ Other
(include all non-citizens)

Applicant selected from within the university
______(indicate previous Leg. Position No.)
Applicant selected from within SUS (indicate university)
Applicant selected from outside SUS

.Copy 1-Personnel & Faculty Relations

universities to increase the number of qualified minority and women professionals. Institutional research is faced with providing statistics on student applications, acceptances, attrition, remediation, career choice and guidance, and a myriad of other topics. However, a discussion of these concerns is beyond the scope of this presentation.

Conclusion

Affirmative action requires commitment by both the affected minorities and the policymakers, as well as adequate documentation of problems, needs and goal achievement. In theory goal setting and monitoring, while inconvenient, seem a reasonable price to pay to achieve equality of opportunity. However, in closing, I would like to share with you some thoughts of a non-minority man faced with implementing goals for his small but critical administrative area. Let me say as preface that USF's goals were expressed in terms of Full-Time Equivalents rather than headcounts.

"Subject: Hiring goals for the Division of . . .

"In your memo of . . . you kindly offered to answer questions or resolve discrepancies.

"As you know, there is only one faculty position in the Division of . . . . By 1975-76 you have established a goal that I should become 9% black. That requirement in itself is not so difficult if one of our current research projects proves feasible. However, in 1976-77 you have added an additional requirement that I be transformed into 4% other minority, in addition to being 9% black. Up to this point the possibility is fairly good that I can meet your goals, but the 1977-78 goal seems impossible. By this time, I am to transform myself by 20% to the status of female. This probably represents a challenge of chemistry. Assuming medicine has progressed to the point that we can determine percentage of sex by a chemical technique. I suppose if I consume a certain amount of hormones each day I may make the goal. I assume the 1978-79 goal of becoming 7% more female reflects an anticipation on your part that I will probably take an overdose.

"Please advise me concerning 1979-83 goals as they relate to becoming more female. I have a number of responsibilities at home and they should be advised of what the State expects of me, if I am to continue in my present position."

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MEASURING THE BENEFITS OF GRADUATE STUDIES AMONG BLACKS: DIFFERING PERSPECTIVES

Annie R. Hayes,
Federal City College

One of the challenging issues of higher education today is the persistent hope of the black community to utilize its professionals in assisting its less fortunate members. Hence, a scheme to foster the leadership role of educated blacks is warranted for institutions of higher learning.

Diversified strategies for improving the value of education to its recipients are available to faculty, administrators and policymakers involved in planning. One of the most useful techniques is the review and modification of the academic curricula by the faculty. This approach enhances their relevance to the ever-changing needs of students. Another scheme would be to survey predominantly black institutions concerning their difficulties and problems peculiar to providing quality education to clients. The more popular technique is an economic analysis of direct and external benefits traceable to higher learning. In examining the extent to which black colleges are meeting their primary responsibility toward the black community, the third method presented seems most plausible for the purpose.

As prototype research for assessing the relative educational gains of social subgroups, the Office of Institutional Research (OIR) at Federal City College (FCC), in cooperation with its Graduate School, plans to follow-up its graduate school alumni in the past five years. FCC appears to be ideal for studies of this nature because of its commitment to the education of minorities. Furthermore, FCC also aims at providing the District and the Washington Metropolitan Area a highly qualified source of manpower.[1]

Within this framework the immediate research problem is to explore alternative means of measuring the short-term impact of graduate education on the black professional and his community. A secondary purpose of the study was to evolve a communication scheme between the alumni and the graduate school which should be instrumental in improving the quality of education among minorities. It is also postulated that this improved quality education at FCC should eventually expand the growth of black professionalism which is most needed to provide leadership in various areas of endeavor.

The first part of this paper will highlight the concomitant issues, challenged by human resource specialists, in the area of evaluating the short-term returns derived from education. The second part of the paper will describe the research design planned on FCC's graduate alumni.

Concomitant Issues

Traditional research studies evaluating the returns of investment in postsecondary education among white males appear to be conclusive and extensive. Contemporary research on the professional life of minorities,[2] however, has raised uncomfortable questions concerning the applicability of traditional variables that proved valid for the white male group. The variables commonly referred to are socio-economic background, individual ability and college quality. Results of recent studies have focused on the significance of new techniques which might be instrumental in relating the quantifiable and non-quantifiable outcomes of advanced training to equality of access in employment and education. It is hoped that these techniques could also be useful in interpreting the educational as well as the occupational experiences of minorities to assist them in the attainment of their aspirations.

Issues addressed by human resource experts will be recapitulated in terms of:

- identification and measurement of educational benefits;
- equalization of opportunity to learn and earn; and
- college quality related to income levels.

Identification and Measurement of Benefits

In the area of identification and measurement of returns to educational investment, Lenning (1974) proposed five methods. These are: a) the benefits pyramid model which emphasized social benefits first and student benefits last; b) the documented current benefits scheme, based on the observation that college experiences seem to develop the personal competence necessary to face life but fail to account for individual differences; c) the documented potential benefit model which utilizes innovative programs and institutions; d) the unique institution method which focuses on the high quality performance of highly selective colleges that appear to have had some significant effects on their students; and e) the consensus method which consolidates expert opinion, logic and identified needs. Lenning also postulates that the increasing trend in casting-off the traditional diversity in higher education could partly account for the apparent loss of confidence in the value of a college education today.

Efforts to rectify the simplistic analysis of economic returns to education as the main value of higher studies are evident in the works of Weisbrod (1970) and Clark (1973). Weisbrod underscored the financial benefits that might accrue to the individual and his family. However, he elucidated on the value of non-marketable returns (i.e., civic-spirited citizens and model employees) to the individual's employers, neighborhood, and community. In fact, Weisbrod acknowledges our inability to measure all conceivable returns to education. He, therefore, praises the rate of progress that has been made not only in the identification of the various forms of educational benefits, but also in the development of objective techniques to measure them.

Clark likewise suggested further research on policy-related concerns in the field of subsidizing college education.

Research topics Clark was interested in were the quantitative analytical techniques of assessing social benefits, the relative significance of differentiated abilities and differentiated opportunities to minorities (to encourage greater college entry among them), and the planning of alternative educational systems to improve the social mobility of the disadvantaged. Vaizey (1970), the economist, reaffirmed the considerable equalizing force of education on an individual's social, occupational, and economic status. His findings support the positive relationship between educational attainment and income level. On this basis, Vaizey admonishes researchers to be cautious in the application of techniques to insure the accuracy of educational impact measured.

Accessibility of Training and Employment

Discrepancies noted in the academic achievement of whites and minority groups have strengthened the movement to challenge the credibility of the Civil Rights Legislation of 1964. Studies undertaken along this problem have ranged from the view of having school systems rectify the inequities existing in communities beyond their control to studies on factors related to salary differentials between men and women.

For purposes of assessing inequities in educational opportunities, Walberg and Bargen (1974) synthesized the concepts that are most likely to be associated with the problems of implementing this social policy. Ideas recapitulated varied from school quality to egalitarian ideology and the distribution of resources. This report, however, emphasized that these inequities imbedded in the American society would necessarily involve all community action groups in order to realize some results.

Along the same line, Jensen's (1974) outlook on the discrimination against minorities has been modified by the results of his experiment[3] on the educational achievements of minorities in California. Wherefore he advocates that diversity of instructional techniques and programs should be encouraged to obtain the optimum benefits of schooling.

Studies examining the extent of differential income between the sexes which might be ascribed to discrimination are represented by those published by Darland and associates (1973), Gatswirth (1973), and Bosworth (1973). More specifically, we find that Darland's national study of faculty members indicated that women tended to receive lower salaries than their male counterparts (on the average, $1,500 annually) irrespective of ethnic classification.

Another phase of sex discrimination was pursued by Gatswirth to identify the specific occupations and industries where women appear to have been disregarded. His contribution to the measurement of earnings differential between the sexes was a statistical technique to monitor advancement of women relative to men over a period of time. He also proposed that to obtain a comprehensive opinion of the problem, the study of earnings should be complemented with employment history data.

Bosworth's analysis of the 1970 census data on occupations by industry parallels Gatswirth's purpose and findings. In fact, he inferred that women were consistently discriminated against in all occupational and industry groups studied. His paper likewise indicates that the least salary differential was reported for the traditionally female occupations (i.e., librarians, social workers, and teachers in school systems).

Alongside other research findings on sex discrimination is Patterson's (1973) abstractions on the factors currently found in our society that seem to have interfered with the professional status of women. For instance, she stresses the relationship between the private and public costs of educating women vis-a-vis the social benefits derived from education because of women's family and social responsibilities. Another factor presented was the level of education and occupational aspiration of women as influenced by parents and teachers. These aspiration and achievement levels are unknowingly contaminated with the purpose of avoiding success to be acceptable to one's peer group.

To determine the relative success of the Civil Rights Legislation in equalizing economic returns of education, Hemley and Fan (1973) utilized the decennial census data of 1960 and 1970 for 30 states in their analysis. This research recommended that a scheme for assisting the blacks (i.e., educational subsidies, supplemental income, and training) should be provided. Hemley and Fan believe that this strategy is crucial in improving the economic status of blacks in the near future.

An innovative system of understanding the effects of higher learning was defined by Page (1973) when he stressed the need to synthesize the interrelationship of three factors. These factors are: a) the equality of access to training and employment; b) the identification of the sources of human differences; and c) the "bentee" strategy to measure educational advancement among program participants.

The hypotheses formulated to distinguish the perceived returns of higher education on diverse subgroups[4] state that:

1. The short-term impact of graduate education among younger alumni with responsible positions before and after the completion of a masters degree would be greater than their older colleagues with comparable positions.
2. Job promotions and increased earnings would be more prevalent among graduates in business administration than among specialists in education.
3. Short-term benefits of an M.A. degree would be more discernible among graduates who are committed to a doctoral or a professional program than among those who have shown no interest in further studies.

The model planned for analysis will utilize such statistical techniques as factor analysis and the maximum likelihood estimate for contingency tables with zero diagonal. This analytical strategy was meant to distinguish the significant variables associated with the short-term returns of horizontal and vertical movers vis-a-vis those significant variables that may be typically related to stayers (non-mover group).

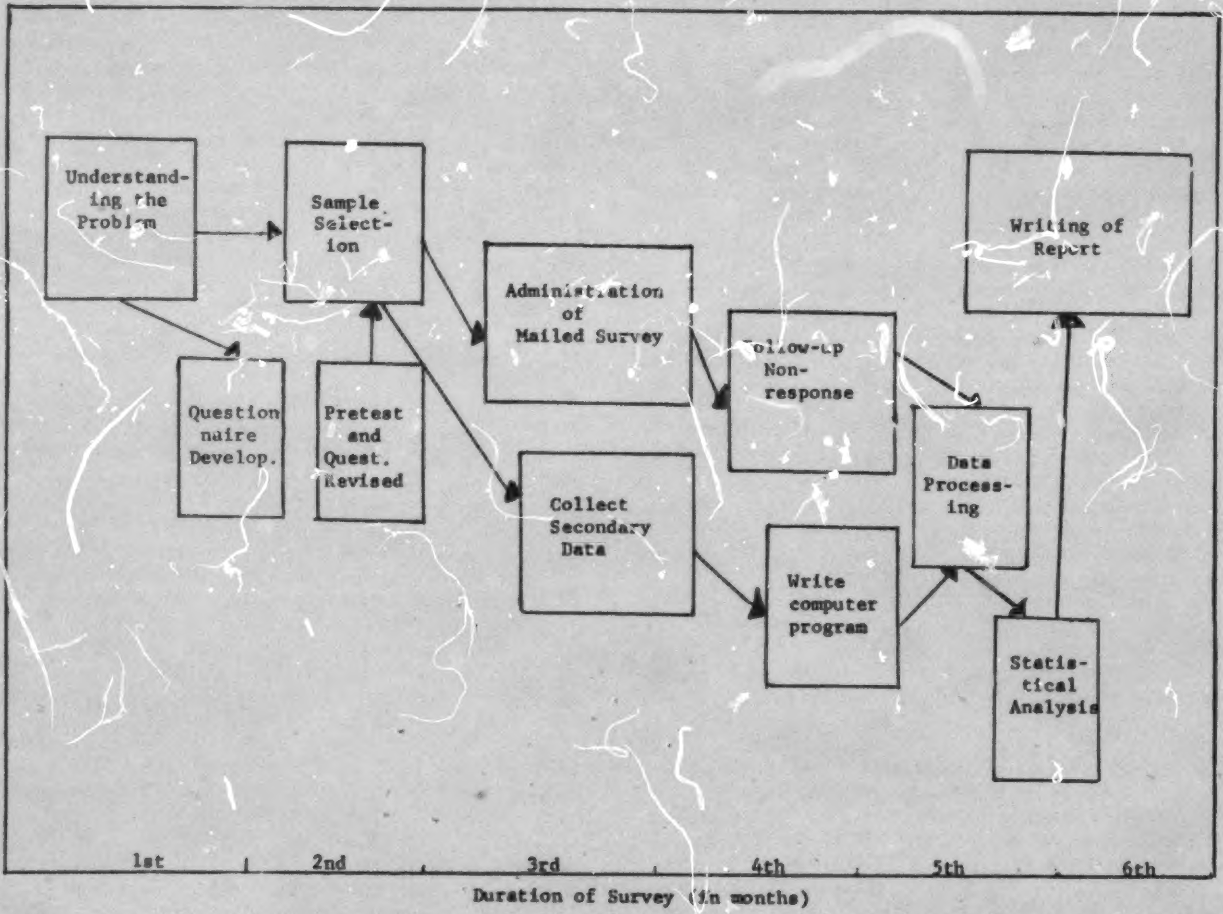
The study will become a source document for improving techniques of quantifying the short-term and, eventually, the long-term impact of advance studies on the individual, his family, and the community. Contemporary feedback of information from graduates exposed to the real world of work would be invaluable to FCC's policymakers who are entrusted with the responsibility to reexamine FCC's instructional delivery system. Periodic evaluations of this type should improve the quality, adequacy, and relevancy of FCC's programs to its clientele as well as to the needs of the local labor market area.

The time-phasing frame of research tasks displayed in Figure 1 was devised to depict the inter-relationship of research tasks. Assuming that a professional with considerable experience in survey research is assigned to this study half-time, it is expected that the results will be available in about six months.

Expected Value to Education

Considering the prevailing enrollment and productivity

Figure 1.
TIME-PHASED ASSESSMENT OF BENEFITS AMONG BLACK GRADUATE SCHOOL ALUMNI, FCC, AY 1970-74


Understanding the Problem
Sample Selection
Administration of Mailed Survey
Follow-up Non-response
Writing of Report
Questionnaire Develop.
Pretest and Quest. Revised
Collect Secondary Data
Write computer program
Data Processing
Statistical Analysis
1st
2nd
3rd
4th
5th
6th
Duration of Survey (in months)

trends in higher education in the early seventies (i.e., decreasing enrollment, high attrition rate which limits the size of available trained black manpower, smaller amounts earmarked for financial aid), the political power attached to education by minorities and the dynamic nature of education in itself, one cannot overemphasize studies of this nature. For example, this type of document should provide policymakers with objective and up-to-date bases for modifying public policies that concern their constituencies. For educators in particular, review of empirical results on the personal, family, and social impact of graduate training would provide them with some guidelines for formulating alternative programs and teaching techniques that could be simulated for allocating limited personnel and financial resources.

College Quality

Because of the alleged positive effects of college "quality"[4] on the student's persistence in college and on his satisfaction with college training, as cited by Astin (1971), other studies on college quality were also examined. For instance, the report prepared by Staaf and Tullock (1973) recommended that an alternative educational program be devised for the disadvantaged to respond to their quest for social mobility within the foreseeable future.

Despite the polemics attached to the measurement of college quality, Wales (1973) concluded that the quality of college attended (in terms of an individual's lifetime earnings) appeared to be of greatest importance to those with graduate degrees, the least effect on bachelor-degree graduates, and with intermediate results on the non-degree respondents.

Inferences drawn from earlier interdisciplinary studies imply that the academic and social climate of today appears reassuring to the plight of disadvantaged subgroups. This climate calls for the concerted militancy of professionals committed to the common cause (i.e., equalizing chances of learning, earning, and leading a full life).

In the spirit of FCC's *raison d'etre* to create an educated manpower pool for the leadership of the District and the Washington Metropolitan Area,[5] we at FCC are continuously searching for various means of improving the quality of our educational outputs. In our quest for information on the relevance and utility of training FCC provides, we have decided to study our graduate school alumni.

Research Design

Recognizing the possible precipitating effects of factors underscored by earlier scholars, we decided to undertake this study in order to assess how black institutions like ours have succeeded in enhancing the lives of black professionals and their communities. This survey will enlist the assistance of 570 FCC alumni who have completed masters degrees during the academic years of 1970-74. The universe of graduates will be stratified by sex and field of specialization.[6] A mailed questionnaire, requiring approximately ten minutes to complete, has been designed to address questions regarding the perceived short-term benefits of their masters degree. The areas of inquiry include:

- motivations for pursuing graduate studies;
- patterns of mobility as a result of graduate training;
- quality and adequacy of graduate training at FCC in relation to employment after graduation.
- plans for postgraduate and professional studies;
- values attached to FCC alumni news service; and
- historical information[7] pertaining to:
    - unemployment,
    - main job responsibility,
    - relationship of major to job,
    - type of organization affiliated with,
    - utility of graduate studies to job, and
    - annual income levels.

For purposes of insuring high response rate, we deliberately abstained from securing academic and demographic information through the survey form. Instead, we chose to rely on the secondary data that can readily be obtained from the FCC students' permanent records.

Dependent variables that reflect short-term benefits derived from graduate education will be assessed in terms of the graduates' horizontal as well as vertical mobility in their professional careers. This advancement will encompass any changes in further studies along the same field, sources of job satisfaction, and involvement in community affairs which can primarily be attributed to the completion of a masters degree. The independent variables that will be used to test the hypotheses postulated below are: the graduates' age, sex, time lag between completion of baccalaureate degree and entry to graduate school; major field of specialization; reasons for enrolling in graduate school; and the type of participation in alumni affairs.

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[1] The goals and responsibilities of FCC (serving a predominantly black population) are presented in the D.C. Board of Higher Education, Resolution No. X-48, March 12, 1969.

[2] Minorities include women and ethnic groups such as blacks, Spanish-Americans, American Indians, Asian Americans, and Africans.

[3] Sample pupils included Anglo, Negro and Mexican American groups.

[4] College quality refers to the average academic ability required by an institution for admission to postsecondary schools.

[5] FCC is the first and only public liberal arts, low cost, urban land-grant institution of higher learning for residents of Washington, D. C. It was designed to increase college enrollment among the culturally and economically disadvantaged students by practicing an "open admission" policy and providing basic skills training, personal and academic counseling, and financial aid.

[6] FCC offers masters degrees in adult education, human ecological systems, business administration, communication sciences, media, information and learning systems, and teaching.

[7] Includes activities during graduate studies, right after M.A. completion, and their current jobs.

[8] Values of higher education will be contrasted by age, sex, commitment to further studies, community participation, and major field of specialization.

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THE FUTURE OF POSTSECONDARY EDUCATION FOR BLACK AMERICANS

James E. Lyons,
Fayetteville State University

Very few scholars would argue that the black college and university grew out of the history of segregation that existed in the South. The "inherent" inferiority of the black American made it unlikely that any serious thought would be given to establishing liberal arts colleges for black students. Nevertheless, there is some evidence, according to historian Rayford Logan (1969), that although there were no black colleges prior to 1852, black students had studied at Rutland College in Vermont, Jefferson College in Pennsylvania, Athens College in Ohio, and Hanover College in Indiana. Such black Americans as Ira Aldridge, Alexander Crammel, and James Pennington had even studied abroad. Bowles and DeCosta (1971, p. 12) conclude that approximately 28 persons of acknowledged Negro descent were graduated baccalaureate degrees from American colleges by 1860.

Historians of higher education in the United States usually identify Lincoln University, Pa. (1854), founded by the Presbyterian Church, and Wilberforce University (1856), founded by the Methodist Episcopal Church, as the first colleges for black Americans. Long before this time, however, there were attempts to establish higher education institutions for black students. Most of these institutions were sponsored by two basic groups, the American Colonization Society, a white citizens group in the South which felt that blacks should be educated in order to be useful in Africa; and the Convention of the Free People of Color, working with abolitionists, which argued for the establishment of institutions of higher education to prepare people of color for service within the American social order. Representatives of these groups paved the way, both North and South, for the formal higher education of black people.

The major impetus for a planned educational program for black people occurred prior to the close of the Civil War in 1865 when Congress passed an act creating the Bureau of Refugees, Freedom, and Abandoned Lands. Its first commissioner, General Oliver O. Howard, for whom Howard University was to be named, was charged with providing the freedom with the foundation of an education. The direct responsibility for establishing the freedmen's educational system in the South was to rest upon several strongly motivated groups of white Christians. Many of these Christians were eager to educate the former slaves because they felt that they had to be able to read and understand the Bible to develop themselves religiously.

Thus, the beginning of black higher education was, in many ways, no different from that of non-black higher education. The major initial concern was to develop members of the clergy. Just as the Anglicans, Puritans, and Congregationalists established many of the non-black liberal arts institutions in the North, the Baptists and the Methodists established many of the black institutions for higher education in the South.

During the period 1865 to 1890, the largest number of historically black private higher educational institutions were founded. Literally, hundreds of them were founded with "normal," "college," and "university" in their titles. Although most of these colleges were offering high school work, one was established for the purpose of catering to those who had been prepared for collegiate and professional training—Howard University. Howard was established in 1867, and it can truly claim the role of the first black university.

Some 17 of the 35 historically black public colleges now in existence were founded prior to 1890, the other 17 were founded later, as a result of the Morrill Act of August 30, 1890. Popularly referred to as the Second Morrill Act, to differentiate it from the Morrill Act of July 2, 1862, this act provided for the establishment and maintenance of Negro land-grant colleges and universities (1971, p. 12). Between 1890 and 1899, a black land-grant college was established or designated in each of the 17 Southern and border states. In general, these land-grant colleges were agricultural, mechanical, industrial, and nondegree-granting until at least 1895. Then, the black colleges began to expand from institutions primarily concerned with the training of teachers to institutions offering a variety of higher educational opportunities. As Bullock (1967) explains it:

> A natural process of segregation had set in as Negroes concentrated to compose racial communities in the various towns and cities. The inadequacy of leadership for the freedmen's welfare began visualizing higher institutions in which Negro preachers, doctors, lawyers, and others of a professional class could be trained with potential teachers. (p. 31)

The black college was now beginning to develop into an institution designed to meet most of the particular needs of the black community. For example, the pulpits of churches had to be filled by an educated leadership. Churches continued to multiply and soon began to rival the schools as the most powerful influence in black community life. Nearly all the private colleges for black people had theological departments in 1890, and before the close of the century private colleges had produced numerous ministers who were trained in divinity.

The black community lived segregated from mainstream America. However, the many daily needs of this separate community justified giving black students higher professional training. These institutions soon turned toward a curriculum that would meet the communities' needs. They began offering business, journalism, economics, and medicine in addition to theology. Slowly black college graduates began to work their way into the structure of the black community. Teachers, preachers, merchants, physicians, and lawyers were beginning to assume some roles of leadership in the community. By the early 1900's these areas, as well as the United States Post Office and the Pullman Porter Services, had become the chief source of employment available for college-educated blacks.

By the 1950s the black colleges began to move into a new era in their history. The *Plessy vs. Ferguson* decision of 1896 gave the legal sanction of the federal government to local laws and customs that had sprung up to relegate blacks to a position of a separate society within the larger American society. As a result, the black colleges and universities were clearly given the responsibility of providing the higher education for the majority of blacks in the United States, both North and South.

The 1896 decision stands as monumental because it legally recognized black people as second-class citizens and placed the legal responsibility for educating black students in the hands of black people themselves. This decision was even more significant because it also placed the black institution in the position of having a moral obligation to educate the masses of black citizens. But today a major change has occurred. Now that the federal government has passed laws prohibiting racial segregation and discrimination in higher education and giving black Americans "equal" citizenship, there exists neither the legal nor the moral justification for operating a dual system of higher education.

Although historians differ in their points of view about the traditionally black institution, most would agree that the origin and development of institutions of higher education for black Americans has been directly related to the existence of a system of slavery in the South from 1660 to 1865, and to the caste system that replaced it, as well as the widespread existence of racial prejudice on the campuses of northern universities and colleges prior to the 1950s.

One must read between the lines to fully appreciate this statement. The development of segregated higher education for black Americans is as much a result of northern prejudice and racial discrimination as it is of the system of slavery which existed for more than 200 years. In effect, the doors of black institutions of higher education were kept open, in part, as a result of the northern universities' refusal to accept the responsibility for educating their black citizens. Thus, the blame for perpetuating the dual system of higher education should not be placed in the hands of the South alone; the North is equally responsible.

There is no doubt that the black colleges and universities have assumed the historic responsibility for the education of black Americans. A partial list of the areas in which graduates of black colleges have taken their place in society is revealing: 7 of 14 U.N. appointment, 4 of 8 more recent black ambassadors, 3/4 of black commissioned Army officers, 3 top commissioned naval officers, the vast majority of black federal officers, 1/3 of the black U.S. representatives and 1 black senator, 64% of black state legislators who attended college, and 83% of all black physicians. These figures have increased since 1970. This kind of evidence should leave little doubt that the black colleges and universities have made a major contribution to the development of the black community, and their value could not be easily replaced should these institutions not exist.

Desegregation—Integration—Merger

The support of two systems of higher education has no doubt been a tremendous expense to many states. But, until recently, that did not deter them. Many of the states had authorized "separate but equal" facilities. Tennessee State University, for example, was established for the purpose of training colored teachers to meet fuller the demands for more efficient and practical instruction in public schools. Some states had also enacted legislation providing scholarships for black applicants, enabling them to study outside the state and in other states where the courses they sought were available to them. This was done to keep black students from attending white institutions.

In 1954, however, the U. S. Supreme Court in the famous *Brown et al. vs. Board of Education of Topeka et al.* settled the legal and moral issue of "separate but equal" when it ruled that the doctrine had no place and that separate educational facilities were inherently unequal.

The decision of 1954 was to have some very special effects on traditionally black colleges and universities. Though they may not have realized it at the time, these institutions were to find out that they were expected to comply with the law, or at least that their states were expected to comply fully. Thus, pressure for the desegregation of black schools, particularly state-supported schools, was soon to plunge black colleges into a new crisis.

Integrating the colleges and universities today is quite different from what it was a decade ago. Non-black faculty and students who came to these institutions during the integration era are now right in the middle of a mood that emphasizes blackness. Of course, not all non-blacks came because of their belief in integration. Non-black faculty members were often recruited to meet accreditation guidelines. According to Johnson (1971), 36 United Negro College Fund affiliated schools had 28% of faculty with earned doctorates. The regional associations required 30%. Consequently, black schools have had to hire non-blacks in order to be accredited. This has been a point of criticism because often these faculty members were those who had teaching difficulties elsewhere, those who had retired, or non-blacks from other countries, i.e., Chinese, Japanese, who have had difficulties with the English language.

There is one story of desegregation and integration that, while successful, has caused a tremendous amount of concern among those interested in traditionally black colleges and universities. This is the case of West Virginia State College. Calloway (1972), reporting in a recent article for *College and University Business*, called West Virginia State "a living laboratory of human relations." It has gone from black in 1953 to 50% black in 1956 to 80% non-black in 1965. While more than 90% of resident students are black, the great majority of commuting students are non-black. Rather than proving harmful, school integration has been quite helpful to West Virginia State. Prior to the 1954 Supreme Court decision, the school was suffering from low enrollment. Now the enrollment is up and all appears to be going well. The academic quality of students has improved, average faculty salaries have risen, and university grants have increased. According to Dr. Calloway, all this was done without any programs for racial harmony.

The major question that integration raises, however, is whether or not it will bring about the disappearance of traditionally black schools as predominantly or all-black institutions. This issue has been complicated by the increasing recruitment of black students by non-black colleges and universities, and by recent mergers of black schools with non-black schools. Although West Virginia State is now considered the classic case of what integration can do to a traditionally black school, it is not the only school facing this experience. The Carnegie report, *From Isolation to Mainstream* (1971), found that of the 123 institutions that were listed in 1965 as having predominantly black students bodies only 105 reported in 1971 that the majority of their students were black. A recent article in *Ebony* cites 11 black public colleges that have a non-black enrollment of 10% or more. Also a series of annexations and mergers and an influx of non-black students have reduced the number of black state colleges from 35 to 29 in recent years.

Some observers suggest that black enrollment in non-black institutions is the major cause of change. Where black institutions used to educate the bulk of the black college population, over half of the black college students are not in non-black institutions. They feel that the negative views many hold about the black institutions cause many black parents to send their children to non-black schools. Other black scholars, however, feel there seems to be a "blue print" for the elimination of black colleges and universities.

The "blue print" theme is not being taken lightly. In at least seven instances in the past five years, a state has created a "white competition" near an existing black college. Some states would probably like to save money by closing the black school. Segregationists no longer need black schools; they are just a financial burden. There have also been other significant developments that cause alarm to black institutions. Prairie View A & M is now a part of Texas A & M; the former Arkansas A M & N is now the University of Arkansas at Pine Bluff; the former Maryland State is now the University of Mayland-Eastern Shore. The attempt to save money during the period of austerity is viewed by many as the cause of these developments.

There are other factors which cause many to wonder whether or not there is an attempt to eliminate the traditionally black institution. For example, a 1972 ruling required that Tennessee State University double its non-black faculty and triple the number of non-black students. Coupling this with the closing of nine predominantly black Florida junior colleges and the building of a University of Tennessee Center in Nashville, home of Fisk University and Tennessee State, one can at least appreciate the concern that black educators have about the possibilities of an effort at systematic elimination of black colleges.

Although it would be quite difficult, if not impossible, to prove that a "blue print" for the destruction of black colleges and universities exists, the concern of black academicians who believe this cannot be taken lightly. This concern stems in part from what has happened in the public secondary schools. Throughout the South integration has brought with it a reduction in the number of high-level black educators. Where the black educator was the principal in the all-black school and the athletic director made the decisions regarding physical education and interscholastic athletics, after the schools were integrated, the blacks became the vice principal and head football coach, respectively. The top positions went to white staff members. Whether this will happen at the higher education level is a most important question.

Predominantly White Campuses

While questions are being raised concerning the survival of black colleges, they are being raised about the black students on predominantly white campuses. The Civil Rights legislation of the 1960s turned the interests of many predominantly white institutions to the large pool of black students that usually made their way South to traditionally black colleges and universities. It was made clear that in order to continue to receive the much needed federal funds, black students had to be recruited. As a result, elaborate means were devised to interest black students in an institution that was considered insensitive to and uninterested in the black community.

Financial aid was a key factor in attracting the black student. Elaborate financial aid packages were granted to students expressing an interest in enrolling. Many of these students probably would have headed South to a traditionally black college or remained at home. The possibility of a four-year scholarship attracted the attention of black students who were dependent upon financial aid, and increased the black presence on the predominantly white campuses almost overnight. In a national study on the black presence in higher education during the 1969-70 academic year, this writer reported to the *Journal of College Student Personnel* that more than 8,000 black students enrolled in these universities in September of 1969. The figures for 1970 were even larger.

In addition to the financial assistance that was given, academic policies were made more flexible to accommodate these students. In many cases admission standards were lowered or altered in order for more black students to be admitted. Admission staffs began to place more emphasis on letters of recommendation, high school grades, and motivation, as opposed to standardized entrance tests. To justify the admission of larger numbers of students who did not meet the usual admissions criteria, these officers began to espouse a point of view that many black educators had been expressing for years, namely, that standardized entrance tests may not be the best predictors.

The "Special Programs" have been another method of recruiting black students. While these programs vary from institution to institution, the basic pattern is the same. A staff made up, for the most part, of black faculty and administrators sets up a special program of admission for black prospects. The program often required that the student attend a special summer session. During this time he was given a special orientation which included a combination of remedial help as well as an introduction to university life.

Once the student enrolled, he was often given special tutorial assistance, counseling, housing arrangements, and sometimes academic advantages. It was common for students in such programs to be given a "no-cut contact" for the first year or two. During this time he or she would not be suspended for academic reasons. Usually, the director of the program, another staff member, and a member of the Student Personnel Office evaluated the progress of the student to determine his status.

While the college could not meet all of the student's personal and social needs, it provided the means by which students could adjust to the campus with a minimal amount of difficulty. More and more black faculty were recruited to help provide a sense of community. In addition, funds were made available to students to establish cultural programs. The most popular activity on the campuses was the Black/Afro-American History Week. Most institutions with a sizable black student population had some form of Black History Week.

The administration, student government, and university programming bodies poured thousands of dollars into these programs. Black scholars, intellectuals, poets, artists, and entertainers were brought to the campus. Agencies specializing in Afro-American talent sprang up in almost every major city in the country. All of the work and preparations resulted in a program that made a unique contribution to the institution as a whole. Often, a successful Afro-American History Week was enough of a "shot in the arm" to a frustrated black student to help him complete another year of study.

Another agency which appeared on the campuses was the Afro-American/Black Cultural Center. The center was usually an old building given to the students after considerable renovations. The University often made a modest financial contribution to keep the facility operable. These centers were usually culturally nationalistic as well as politically concerned. The students usually adopted the views of strong cultural figures as Imamu Baraka, or they endorsed political activists such as Huey P. Newton. The main function and possibly its ultimate *raison d'etre* was to provide a place where students could come together. The Center was the one place where black students could count on seeing other black students.

Curricular changes were also made to accommodate the black student. Black Studies Departments, as well as major and minor concentrations in Black Studies, were developed for interested students. Departmental curriculum committees perused their curricula in order to determine where changes to accommodate the black experience could be made. Over the objections of some, courses sprang up dealing with the black man and his contribution to society. Black scholars were brought to campus as visiting lecturers, for departmental colloquia, and in some cases for one year appointments.

In short, there was, in most cases, an attempt to make the campus community more sensitive to the black experience. However, this was too often done with little thought or substance and, as a result, it was destined to be ineffective. Black faculty and students and white faculty and administrators soon became concerned with the lack of substance in many of the programs, and began to demand that changes be made to alter the direction of the programs.

Many faculty and administrators became disillusioned with the flexibility of the admissions program as it related to black students. A serious question emerged as to whether or not the institution was doing harm to black students by enrolling them if they lacked the basic high school background. Some institutions that were able to attract large numbers of students in September were suspending an even larger number in May. Black students themselves began to question the "revolving door" practices at their institutions.

The inability and, in some cases, a lack of desire to accept a "foreign" social environment, made life unbearably hard for black students. In addition to frequent racial misunderstandings, the students often found it absolutely necessary to segregate themselves from their fellow white students. Black Student Organizations were formed on virtually every campus.

In addition to black organizations, certain other developments took place. All-black dormitories, wings of dormitories, floors, lounges, dining hall tables, etc., came into being. Black students turned inward and began to cling to each other for support. Initially, these segregated arrangements were accepted, but after HEW, the NAACP, and the ACLU began to question these practices, many were eliminated as institutionally-supported activities.

The importance of financial aid has already been mentioned. However, when federal and state coffers began to "run dry," it had a severe effect on the black student. The economic woes of the early 1970s had the result of removing college from the realm of possibility for many black students. Scholarships were limited, demands became louder for tuition increases at publicly supported institutions, and loans replaced grants as the major source of financial assistance. Where students had been given three years of aid and one year of loan, the situation reversed itself. Federal funding which helped initiate so many of the programs responsible for supporting black students became more and more uncertain until many of the programs were eliminated or reduced to such a point that they no longer served the students' needs.

While more black students are going on to college than ever before, it is no secret that many predominantly white institutions have cut back to a near token admission of black students. In the Northeast, in particular, institutions that used to boast large numbers of black students admit that black student enrollment has fallen off drastically. One major Northeastern institution that had been attracting more than 200 black students a year for the past 4 years, admitted only 68 black students this year, all of whom were in the special program. Reports seem to indicate that this is happening on many predominantly white campuses. If there is a trend, and it continues, what will happen to the black presence on these campuses?

The Future

Ordinarily one might surmise that black students might return to the traditionally black campus. Although the desirability of this could be subject to question, it would appear that many of these institutions may not survive to offer black students this option. There is good reason to believe that the next three to five years will see some drastic changes in the number of traditionally black institutions that survive.

It would appear that those individuals involved in institutional research and planning must certainly help answer the question of what will be the postsecondary educational fate of black Americans. If the black college is being threatened with the possibility of dissolution, and financial resources are no longer available on the predominantly white campus to support larger numbers of black students, how can we be sure that black Americans will have an opportunity to get an education? What kind of planning needs to take place at the state level? Is there sufficient historical, political, social, and economic justification to warrant state support of black colleges and universities? Are there sufficient data available to justify federal financing of higher educational enterprises for poor black youngsters? Should institutional researchers at historically black institutions lead the movement to gather data on the above questions?

What is being suggested here is that the educational future for black Americans looks very uncertain. It should not and cannot be left to chance. The contribution that blacks have made, and can continue to make, ought to preclude any likelihood that large numbers will be excluded from the educational arena. The education of the people who make up more than 12% of the population is a serious problem. It should be of concern to all who are interested in the well-being of the nation. Careful research and planning on a local, state, and federal scope will allow the best and most prudent decisions to be made.

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ALUMNI FOLLOW-UP STUDY OF SEVENTEEN TRADITIONALLY BLACK INSTITUTIONS

William N. Pruitt and Harding Faulk,
Institute for Services to Education
and the Consortium for Curriculum Change
and Institutional Research

In today's modern society education and technological training are the tools needed to secure preferred occupations and new careers. It is the responsibility of institutions of higher education to prepare its students for these opportunities. Black institutions have been labeled with an additional underlying responsibility of preparing the so-called culturally and financially deprived student to compete on an equal basis with other American graduates. How well black institutions have achieved this goal is a question which this study will explore. Specifically, how well have 17 selected black colleges and universities prepared their graduates to become productive participants in our society?

Indubitably, one of the most important sources of information pertaining to measuring the effectiveness of an institutions' overall program is its graduates. No one has said this more succinctly than M. S. McLean in his observation concerning graduates of American colleges and universities:

> The alumni and ex-students are our products. Only from them can we learn what they got from us, what we did to and for them that was right, wrong, of consequences, of inconsequences, fruitful and wasteful. Only by learning these can we reshape the program of higher education in America so that it may function, be effective and win continued support. Only then can we learn what to cut and what to put into the future ones.

In light of these comments one begins to understand the underlying importance of knowing what an institution's graduates are doing. The knowledge of succes or failure of an institution's graduates in society should have quite an impact on its present and future programs.

Finally, one should be concerned with the overall effects of the present economic and social conditions upon black college graduates. In 1963 Mayhew (1963) showed that the college student in the '30s was conditioned by the facts of a depression and the technological conditions of that period. College students in the '40s were conditioned by facts of war while those in the '50s were conditioned by social affluence. In view of these changing conditions, the question that can be raised is: "To what extent have the events of the '60s and '70s affected black college graduates?" especially since these graduates are likely to have participated in efforts to close the gap between professed equalitarian principles and discrimination practices. It becomes apparent that the literature to date does not report any follow-up studies which answer the above question. Thus, the need for more information pertaining to black college graduates is obvious.

Purpose of the Study

This study is designed to explore the extent to which "developing institutions" of higher education are preparing their graduates to accomplish their occupational and educational goals.

The objectives of the study are as follows:

1. To determine the relationship between present occupation and educational preparation;
2. To explore graduates' attitudes toward collegiate experiences in terms of: (a) opportunities for social growth development, and (b) opportunities for intellectual growth and development;
3. To search for factors relating to the obtaining of present employment;
4. To determine the educational and professional goals of graduates;
5. To determine the degree of financial and alumni support by graduates to their alma mater;
6. To investigate the extent to which graduates have pursued additional formal education; and
7. To determine the degree of community involvement of graduates.

Review of Literature

Black colleges and universities publish or report few studies pertaining to the post-collegiate activities of graduates even though they provide higher education for more than half of all black college students. However sparse the research literature is on black graduates, the studies that have been published appear to accurately reflect black graduates' social and economic characteristics.

The earliest national survey of black graduates was conducted by Charles S. Johnson in 1938. The purpose of Johnson's study was fourfold:

> . . . (a) to ascertain the number, distribution and occupational adjustment of the Negro graduates of colleges, professional and vocational schools; (b) to provide an analysis of some of the important social factors determining the present number and status of these graduates; (c) to test by such means as appear valid and sound the value in terms of higher education of this group; (d) to lay a factual basis for the further study and planning of programs of advanced education with some reference to the social cultural problems which continue to be a part of Negro life.

Johnson's conclusion, which is contained in his book *Negro College Graduate*, was:

> . . . that education should aid the student to adjust to two worlds . . . the world of Negroes and the world of the dominant culture. Their education should begin with what is real and then extend to the outside world.

Johnson also indicated that Negro students should be taught the value of cooperative action in things social as well as economic.

Another study including a token number of black graduates was conducted by the United States Office of Education on the Economic Status of Alumni in 1939 (Bulletin 1937, No. 10, United States Department of Interior, Office of Education). Howard University was the only traditionally black institution represented in this study of more than 46,000 college graduates with bachelor degrees from 31 colleges and universities. Questionnaires were returned from 659 Howard respondents, representing 46% of the Howard graduates. Of Howard University's graduates 49% said they were teaching. Law, medicine, and dentistry were occupations next in order. Seven percent were engaged in individual business or professions and 3% were engaged in partnership businesses. The salary range for the period surveyed was from slightly less than $400 to $4,099 per year. The median salaries were $1,298 for men and $1,999 for women.

Time magazine sponsored studies of college graduates during 1947-48. The survey was composed of 9,064 graduates and 1,037 colleges and universities. These data were analyzed and later published in a book called *They Went to College* by Havermann and West in 1952. The total number of black respondents in the study was 102. Of this number, 60% were school teachers as compared to 29% of all white graduates. Less than one-fourth of them had jobs in business. Six percent were doctors, dentists, or lawyers. While nearly two-thirds of the blacks were in the under $3,000 salary bracket; less than a third of the white graduates fell into this category; and nearly one-third of the white graduates earned $5,000 or more. Only 5% of the blacks had managed to earn salaries of $5,000 or more when the survey was taken. The authors attributed the unequal pay scale and occupational trend to two factors: (a) blacks did not secure the same kinds of jobs; (b) equal pay for equal work was not a reality. Despite these findings 98% of the black college graduates were satisfied with their college experiences and would return to their alma mater if they had to start over again.

Collins (1957) found 85% of the 200 graduates involved in his study engaged in the teaching profession and 67.5% of the graduates indicated a desire to stay in the teaching profession. Collins' investigation focused on determining the motives which caused these graduates to enter the profession in which they were engaged, determining the amount of security the job offered, discovering how long the graduates planned to stay in this work, and discovering what influenced them in making their decision.

Thompson's follow-up study (1960) of Jackson State College graduates during the years 1944-1953 was composed of 306 black graduates. The purpose of the study was to secure information concerning:

(1) the occupational opportunities and economic status of the Jackson State College graduates;
(2) the nature and extent of their professional and personal growth;
(3) the nature and extent of their participation in community and leisure time activities;
(4) the respondents' appraisals of their college education; and
(5) the implications of the findings for the teacher education program at Jackson State College.

Of the respondents 90% were men and 10% were women. The investigator found significant gains of first jobs and beginning salaries were characteristic of the rising level of occupational and economic status of the alumni. In 1958 the median salary for men employed in Mississippi was $3,479.50 and for women $3,059.50; for men employed outside of the state $5,599.50 and for women $4,709.50. Generally, graduates who migrated to other states were making better salaries than those who remained in Mississippi. Most of the Jackson State College graduates were in educational occupations and seemed to have achieved a sense of job satisfaction.

Although more than half of the graduates appeared to be limited in economic, social, and educational opportunities, more black graduates were active in religious, welfare organizations, and professional affairs than was true for other groups studied. In addition, 75% of the alumni had completed further study beyond the undergraduate degree. Specifically, 7 persons had earned additional bachelor degrees, 46 the Masters degree, 23 with additional training beyond the Masters degree, and 3 the doctoral degree.

A study of 98 black college graduates dealing with an evaluation of Lane College's Business Education program was conducted by Clay in 1969. Clay's (1969) study focused on providing the college with information regarding the attitudes and achievements of the 1955-1967 Business Education graduates; evaluating the effectiveness of the program in Business Education and in determining possible additions and/or deletions in course offerings; and in determining contact between 1955-1967 Business Education graduates and the Department of Business Education and Lane College.

The investigator found 76.7% of the graduates employed in educational occupations. The remaining 11.6% were employed in some type of management or secretarial position. All of the graduates employed needed a college degree in order to secure their positions.

Since the locus of the study was on improving the Business Education program, Clay concluded that the Principles of Accounting course was very useful to Lane graduates, while Business Law had little or no value. In addition, he indicated the need for expanded course offerings which would include courses in office machines, business english, and data processing. Such courses as mathematics, speech, and statistics would also be offered for Business majors. The survey also indicated that slightly more than half of the graduates had given some financial support to the college.

Sample

During the planning of this undertaking one of our paramount concerns was the sample size. In reading some of the background materials it became apparent that any attempt to perform a study of this magnitude or of this type would present a multitude of problems. At this point we are using a sample of 1,000 respondents from 1970 to 1974 in 17 traditionally black institutions. We have other data from additional institutions that we will use in our final report.

While survey research relies heavily on use of self-administered mail questionnaires, a continuing problem has been that of obtaining a high rate of return. Various techniques have been recommended including incentives to respondents, aspects of questionnaire design, systematic re-mailings, and use of different mail procedures. Rossman and Astin (1974) experimented with 14 different mailing techniques. The variables they examined were: non-profit postage vs. first class postage on the outgoing envelope; window envelopes vs. matched insertion or questionnaires; postal card reminders vs. live stamps on the return envelope; and three types of non-profit permits.

These gentlemen found that the cheapest was best. Consequently, we have decided to use non-profit outgoing postage and business reply returns or stamps. If we encounter problems with non-delivery, we then will remail those particular instruments first class. There will also be a second wave questionnaire mailed to our hard core non-respondents. This technique has been proven significantly more effective than follow-up postal cards and various other types of non-profit postage reminders. While we will be putting forth an immense effort to complete this project within the designated time frame, we are not too optimistic and will continue for as long as necessary to assure that this endeavor makes a meaningful contribution to our institutions.

Instrument

The instrument was developed from a series of instruments on alumni followup. Since our major concern in this instance was to attempt to ascertain the extent to which our institutions were preparing students in their chosen fields, we used a high percentage of related items. Questions pertaining to major fields, types of degrees awarded, professional or graduate school attendance, type of position held, salary, etc. were used.

We were also concerned with the way alumni felt about the overall institutional environment and educational experience. The questions drawn from other instruments taped such things as feelings about social and cultural development, the intellectuality of the environment, and the stress of the environment.

The instrument also attempted to ascertain the degree to which the institution assisted its alumni in finding employment. There were also a few less significant parameters to look at, i.e., job satisfaction, salary, type of job, and whether or not that job is in the person's area of preparation.

The last area of concern was alumni involvement. Here we attempted to ascertain the extent to which alumni make financial contributions to their alma maters, the extent to which they participate in their local alumni organization, and the extent to which they participate in the activities of their national alumni organization.

Analysis of Data

Data was analyzed both aggregately and by years to attempt to find trends developing. Particular techniques of data analysis used in this study vary according to the specificity and nature of the questions being explored. Where relationships between two variables are specific (i.e. level of education and income), simple tests of association between variables can be used.

As stated earlier, one of the primary goals of this study was to determine the extent to which black students were moving away from the traditional teacher education and social science areas into the more non-traditional science, math and business oriented areas. In the past the opportunities for blacks in these non-traditional areas have been limited which is the primary factor that has mitigated against large numbers of blacks moving into these areas. However, the findings here show that over a 5-year period there has been a 10% reduction in the number of students in the 17 traditionally black institutions surveyed in the field of teacher education and social science.

However, the greatest portion of students lost were shown to be moving into the areas of fine arts and humanities (6%), while the others (4%) were split among science, math, and business-oriented fields. These findings seem to show that students are not flocking to those areas that are "opening up to blacks," but they are gradually moving out of the education-oriented areas. The percentages fluctuate quite a bit from 1971 to 1973 (69% , 65% , 69.5%), so I cannot go so far as to say there has been a major trend established. But I do think I can safely say there is a trend of some minor degree in sight. Although I think we place too much emphasis on trends and, when there is a deviation from that trend, we find that we are not prepared to make the necessary adjustments. Some consideration must be given to trends even if they are at a relatively insignificant level. In this case I think we must consider the fact that teacher training is losing its sex appeal as a result of job scarcity. This has been the case all over the country for quite sometime, but black institutions have just begun to feel the impact in the last eight to nine years.

In looking at the fields that are most frequently chosen as minors, we find that education is still leading by a large margin. However, the margin is decreasing significantly. The percentages of students minoring in education and sociology decreased from 46% in 1970 to 43% in 1971 and 1972, to 34% in 1973 and finally to 27% in 1974. These students did not seem to be shifting into other areas but were not selecting any minors at all which is an indication of either a change in requirements and/or attitudes. There was a small increase in students minoring in fine arts and music, from 3.6% in 1970 to 4% in 1971, to 5% in 1972, to 6.2% in 1973 and 1974. There was an increase in science and math in the last three years after a substantial decrease in 1971, which only brought it back to where it was in 1970. This area went from 11% in 1970 to 5.5% in 1971, to 8% in 1972, to 9.5% in 1973, to 12% in 1974. The area of business and economics went from 3% in 1970, to 7% in 1971, to 11% in 1972, back to 5% in 1973, and to 8% in 1974. The areas of psychology and counseling went from 4% in 1970 to 2.1% in 1971, to 1.5% in 1972, to 3% in 1973 and 74.

The data do not indicate what one would expect to see with exception of the decrease in the percentages of students minoring in education and social science oriented fields. The only other fields that show some established trends are arts, humanities, and music. Students seem less than enthusiastic about the other areas that are "opening up to black graduates." There are a wide range of implications here. Number one, there has been a 10% decrease in education majors in the last 4 years with only 1% accounted for in other fields. The question, then, becomes what happened to the other 9%? It is our speculation that they are moving to other institutions that have better reputations in the other specific areas.

Assessment of overall college experience (i.e., cultural, social, intellectual) was the next area of importance to the researchers. There was an obvious trend developing at the highest level of our scale. In 1970 13% of our respondents felt their overall college experience was excellent. This figure decreased to 11% in 1971, 8% in 1972, 9% in 1973, and 6% in 1974. This is seemingly the case all over the country. There is a disenchantment with the educational experience to the extent that no one feels that it deserves an excellent rating for anything. The other four responses showed no trends but were extremely interesting. There was a significant difference between the above average and the below average response rate. Alumni from 1970 to 1974 felt their institution provided them with an above average (cultural, social, and intellectual) experience. There were only a few responses at the lowest level of the scale.

These three experiences were broken down and asked individually. The question of intellectual development followed somewhat the same trend, but to a lesser degree, as the question of overall college experience. The highest scale level began at 15.5% in 1970, decreased to 14% in 1971, to 9% in 1972, to 8% in 1973, and back to 9% in 1974. The highest rate of response was at the midpoint of the scale and the next highest rate was at the above average end of the scale. Even though significantly more graduates felt they had had above average intellectual experiences on their campuses, the difference between the above and below average responses was not as great as in our previous question.

The responses to social development were somewhat different from our previous questions. In 1970 the highest level on the scale showed a 14.5% response rate, but 1971 through 1974 the people who felt their institution provided them with an excellent opportunity for social development hovered between 10 and 12%. The highest rate of response was at the mid-point on the scale, and there was no significant difference between the percentages of graduates who felt that their experience was above average and those who felt their experience was below average in 1972, 1973, and 1974. The difference between these two groups was much greater in 1971.

The next variable was cultural development which showed no trend on the highest level of the scale. The percentage of respondents who felt their opportunity for cultural development was excellent was 16% in 1970. This number dropped to 9% in 1971 and 1972, moved up to 10% in 1973, and finished at 13% in 1974. There was no significant difference between the group who felt their institution was above average in cultural development and the group who felt their institution was below average from 1970 through 1972. There was a difference between these two groups in 1973 and 1974, but these differences were not statistically significant.

The next variable is concerned with a description of the institutional climate. Those students feeling their campus was intellectually and academically oriented went from 47% in 1970 to 44% in 1971, to a low of 31% in 1972, up to 39% in 1973, back down to 33% in 1974, representing a decrease of 14 percentage points between 1970 and 1974. This is an indication that the institutional environment is making less of an intellectual and academic impact on the students as the years progress. This could be a result of a change in student attitudes or a change in institutional attitude.

Students who felt their institution was vocational or job oriented range from 21% in 1970 to 22% in 1971, to 24% in 1972, to 23% in 1973 and 1974. This did not fluctuate significantly in the four-year period. Those students feeling their institutional climate was collegiate or socially oriented range from 20% in 1970 to 23% in 1971, to 30% in 1972, to 27% in 1973, to 31% in 1974. There is an 11% difference between the years 1970 and 1974 which indicates a significant increase in the number of students feeling their institution is collegiate or socially oriented over this 4-year period. Those students feeling their institutional climate was culturally oriented fluctuated between 4 and 11% over the 4-year period. There was no significant deviation between 1970 and 1974. The percentages of students with these feelings were 8% for both years, and the average was somewhere around 7.5% for the 4-year period.

Summary and Conclusions

The data seem to show that students attending traditionally black institutions are moving out of the education and social science oriented areas. The 10% decrease over the four years surveyed seems to represent a pattern that is consistent in all traditionally black institutions. However, we did not find a significant increase in the non-traditional areas (i.e. science, math, and business), which leads us to speculate that these students are leaving our institutions. In an earlier study done by Blake, Lambert, and Martin (1974) at the Institute for Services to Education, a significant increase was found in degrees granted in business and management between years 1966 and 1970, but this figure seemed to stabilize at around 15 to 16% during our survey period.

There was a significant decrease in the percentage of students minoring in education and social science oriented areas from 1970 to 1974. The other disciplines made no significant changes during this period. It is believed that students are not electing to minor in specific areas if it is not required; consequently, a large number of these students do not have minor areas as such. On the variable assessment of overall college experience, there was a significant decrease in the percentage of students feeling their experience was excellent. The majority of the respondents felt that their institution fell somewhere between average and above average. Student assessment of the institutions relative to opportunities for intellectual development showed a slight increase in the below average feeling for all four years and a slight decrease in the percentage of students that felt their institution was average or above, but this group still represented a sizable majority.

The average and above average group percentages fell even lower on the variable assessment of opportunities for social development. Conversely, the below average group percentages increased by an average of five percentage points overall. It is the feeling of the authors that this phenomenon is a result of a more socially-oriented student who has the feeling that his institution should provide him with the opportunity to be close to his fellow man in whatever ways that it can. For example, some institutions are segregating students by sex which has long since been obsolete on most campuses.

For the last variable, climate that best describes your college, the percentage of students feeling their institution was intellectually or academically oriented fell 14 percentage points over the 4-year span. Students feeling their institutions were vocational or job preparatory averaged around 22% for the 4 years surveyed. The percentage of students feeling their institutions were collegiate or socially oriented increased by 11 percentage points over the 4 year span. The percentage of students who felt their institutions were culturally oriented began at 8% in 1970 and finished at 8% in 1974 with the 3 years in between averaging around 8%. The feeling in this instance is that most of today's students are becoming more socially conscious and, as a consequence, the institutional environment is adapting to the mentalities of their clientele.

Because of the time and length restrictions, all of our results could not be included in this report. There will be a comprehensive report published at a later date.

ALUMNI FOLLOW-UP

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WHAT WE KNOW ABOUT EDUCATIONAL PRODUCTIVITY

David R. Witmer,
The University of Wisconsin—LaCrosse

Productivity, like efficiency, is measured as the value of effects, or outcomes, relative to the value of capital resources and other factors, or inputs, employed in a process. There is a common misconception that measurement of productivity in purely physical terms yields information sufficient for optimal resource allocation. A more useful correct definition of measured productivity is the ratio, not between physical outcomes and physical inputs, but between valued outcomes and valued inputs. The notion of value is crucial; there is no valid way of making comparisons among alternate processes without expressing all of the elements in terms of a common measure of value (Knight, 1968, p. 7).

The Economics of Higher Education

Some activities in higher education—for example, remedial English or clinical tutorials in neurosurgery—are obviously productive. Others—in which inputs are expensive while outcomes are almost worthless, e.g., have little relevance to student needs or societal requirements—are obviously unproductive (Toombs, 1973, p. 12). Most of the complex activities can be elucidated through application of the principles and techniques of economics.

Economics is the branch of social science which studies how men and society choose to employ scarce resources to produce tangible and intangible goods and services for consumption now and in the future. Economics is also the branch of moral philosophy which addresses the following and related questions: (a) How much of man's goods and services should be devoted to immediate consumption and how much should be invested to increase future consumption? (b) How much should be invested in the production of physical capital and how much in human capital? (c) How much in health and how much in education? (d) How much in elementary education; how much in higher education? (e) How much channeled through student financial aids; and how much granted directly to institutions? (f) How much in discovery through research; how much in dissemination through instruction and public service? (g) How much in English programs; how much in biology? (h) How much in supplies; how much in faculty salaries? (i) How much in lectures and demonstrations; how much in personal experimentation? (j) How much in natural field work; how much in controlled laboratories? (k) How much in technician-guided labs; how much in auto-tutorial labs?

The unitary concept. In a free, informed, and equitable society the ideal answer to all of these questions, and to all of the thousands of related questions, is the same. Goods and services should be withheld from immediate consumption and invested in the various processes which produce goods and services for future consumption until the values of the outcomes of all the processes are the same, and equal to the value of immediate consumption. Accountability to assure that outcomes are worth the cost is a necessary but insufficient condition; the value of outcomes should exceed the value of inputs enough to warrant foregoing immediate consumption. The relative values of immediate consumption and diverse investments to produce more for future consumption are easily interrelated and communicated to persons who have very limited understanding of the various processes in terms of the annual rate of return on investment. The equitable and efficient ideal is promoted through application of the decision rule that investments in any alternative should be increased if the rate of return is higher, maintained if the rate is the same, and decreased if the rate is lower, than the interest rate on borrowing the funds to buy the goods and services which constitute the inputs.

Higher education and economic growth. Research, as a firmly established and integral process in higher education, has prestige and is influential in attracting input resources. It discovers, creates, invents, develops, and innovates information which contributes to economic growth under the proxy of technological change. It is presumed to be neither capital nor labor but may be substituted for either or both. The outcomes of research are new ideas, concepts, models, and theories often insufficiently specific to be patented and usually put into the public domain through publication in scholarly journals and through embodiment in students (Schultz, 19[illegible]).

Many of the outcomes of research and concomitant educational activities can be evaluated in terms of their contributions to economic growth. Such evaluations were undertaken during the 1950s when it was found that measurement of the conventional inputs, of man-hours worked and physical capital expended, left about one-half of the economic growth of the United States during the twentieth century unexplained. Edward F. Denison identified the relative level of contribution of each of three sources of economic growth during the period 1929-1957 as: educational attainment 23%, advance of knowledge .3%. He and others estimated the contribution of the increase in educational attainment to economic growth for the period 1950-1962 at 16%, while for the period 1945-1965 the proportion of economic growth attributable to educational attainment was estimated at 10% (Hansen & Witmer, 1972, p. 26). Although these successively smaller values provide a cautionary note, the production of these outcomes of higher education is an important subject of continuing study because it deals with social and external effects, the benefits of which are not capturable by private persons, and which, consequently, form the basis of institutionalized higher education's claim for direct public support as opposed to public support channeled through students.

Investment in Human Capital (1971) is the title of Schultz's presidential address to the American Economic

Association which marks the beginning of a surge of interest in the topic. Although the human capital concept dates back at least to 1687 and William Petty, the father of modern economics, it got little attention prior to 1960 (Kiker, 1966, p. 482). Since then the volume of research in the economics of human investment, investment in education, and investment in higher education has grown dramatically.

Investment in human capital takes place when resources are diverted from immediate consumption to investment in the processes which augment health, knowledge, skill, motivation, location (geographically, and *vis-a-vis* particular jobs), and other characteristics of people which improve human productivity. The procedure is analogous to, and competitive with, investment in physical capital, such as plant and machinery, except that the people in whom human capital is embodied participate in the investment decisions—by choosing colleges, majors, on-the-job training programs, apprenticeships, night schools, television offerings, newspapers, books, public lectures, theatre productions, films, and the other activities which increase their productive potential.

The definitive work on investment in college education was published by Becker in 1964 and has since been extended by him and others to cover the whole range of education (Witmer, 1970, p. 517). The highest annual rates of return are generally realized on investments in elementary education at about 17%; investments in high school, technical school, and college education follow at about 13%; returns to junior colleges follow at about 11%; while graduate education at about 6% lags behind (Witmer, 1971b, p. 3). Although there is great variability according to major programs of study, sex, region of the United States, and race, the rate of return on investment in college education has been rather constant for the past 80 years at a level highly competitive with the 10% return to investment in other public and private enterprises. Researchers in the economics of education are now turning their attention to the effects of channeling funds through students to reduce inequities, and to the utility of higher education as a credentialing agency.

Valuing inputs. Higher education inputs are usually considered in three categories: operating factors (personnel, supplies, and services); physical plant capital (buildings and grounds); and student time and effort. Operating factors are valued at the purchase cost which has been recorded in college and university records and accounts dating almost from the founding of the most ancient institution of higher learning in Europe at Salerno. Physical plant capital has been valued in terms of an inputed annual share of the long term expenditures made to acquire and maintain buildings and grounds. Records of costs of colleges and universities have been summarized and maintained by the U.S. Office of Education since 1870. Cost studies have been made since 1894 (Witmer, 1972, pp. 99-107). Contemporary efforts to develop cost accounting principles and procedures are concentrated in the National Center for Higher Education Management Systems (NCHEMS) at the Western Interstate Commission for Higher Education (Topping, 1974; Johnson & Huff, 1974; Lindner, Aarstad, & others, 1973).

In comparative studies of investment opportunities, student time and effort are valued at the opportunity cost of earnings foregone. Actual earnings while attending college are subtracted from what can be earned by other persons with college students' ability and education. The value of student time and effort amounts to from 45% to 65% of the total cost of inputs for college education.

As John Stuart Mill recognized a century ago, higher education is sought as a good for its own immediate sake as well as an investment for future returns. In recognition of joys which flow from being in the presence of culture, and other immediate benefits, a consumption component of 20% to 30% of the total cost is separated from the component properly assignable to investment, before rates of return are calculated (Witmer, 1972, pp. 114-116).

College operating costs per student, which from 1953 to 1970 had been increasing at annual rates of 3.5% to 8.6% while the consumer price index had been increasing at annual rates of 1.3% to 4.7%, are now growing more slowly than the rate of general price inflation (Kerr, 1972). The predominant college cost—salaries and wages—will probably not keep up with the rate of inflation during the years immediately ahead, because of factors such as (a) the oversupply of qualified faculty and staff, (b) the slow pace of faculty movement toward collective bargaining, and (c) the reluctance of colleges to hire additional personnel in the face of the forthcoming decline in traditional college-age population. Increases in the costs of other inputs will probably not exceed the rate of general price inflation. At most colleges enrollments will grow at a decreasing rate, at least through 1976, and probably through 1985. The net effect of these events may be a relative decline in expenditures per student which may induce complacency. Beyond 1985 declining student enrollments, collective bargaining, the high yields of progressive tax systems which provide support for many public institutions, and the discovery that growing levels of disposable personal income yield unprecedented gift and tuition funds for private institutions will probably converge to promote rapidly increasing rates of expenditure and reestablish the understanding that continuing attention to the costs of college inputs is important.

Valuing outcomes. Hundreds of studies during the past 70 years have yielded only limited evidence that the outcomes of college experiences differ importantly from those of the noncollege experiences of analogous persons. College attenders are evidently different from nonattenders before they enter college and almost all of the characteristics of college graduates are attributable to causes precedent to and outside of the classroom. Most prominent among the few demonstrable outcomes of higher education are: (a) preparation for vocations not generally open to the less educated, (b) the substantially greater productivity associated therewith, and (c) concomitant higher earnings (Cope, Hartnett, & Witmer, 1974).

The many student-embodied outcomes of higher education are valued simultaneously in terms of differential earnings evidenced in data collected in alumni studies by colleges and in current population surveys by the U.S. Bureau of Labor Statistics. These cross-sectional data describing earnings of groups of people with different levels of education are converted to a longitudinal basis and adjusted upward to reflect observed increases in the earnings' rate due to inflation and economic growth. Adjustments for differential rates of income taxation, mortality, morbidity, and unemployment are incorporated (Ekhaus, 1973).The difference in earning ascribable to schooling is then separated from that due to native ability, motivation, family socio-economic status, and restrictionism by reducing the total by 10% to 30% (Hause, 1972, p. 131; Griliches & Mason, 1972, p. 99).

One cannot, of course, merely subtract the sum of costs from the sum of earnings for each expected year of life because the value of earnings at a given level during the early years following departure from school greatly exceeds the value of equal earnings later in life. As a final step, therefore, the values of both inputs and outcomes are discounted at appropriate rates to a common date for the calculation of rates of return (Witmer, 1971a).

Bismarck reportedly complained, "There are ten times as many people educated for the higher walks in Germany as there are positions to fill." Since his time many persons, including prominent economists and educators, have predicted that increasing levels of investment in higher education will result in widespread unemployment of college graduates, and precipitous declines in the value of higher education outcomes. Data from the U.S. Bureau of Labor Statistics indicate that, despite unprecedented increases in college enrollments and in the number of college graduates, for persons 18 to 34 years old the unemployment rate of high school dropouts in 1972 was 13% and the unemployment rate of high school graduates was 8% in marked contrast with the 5% rate of unemployment of college graduates (Shiskin & others, 1973, p. 137). In the long run differences in unemployment levels, will probably shift further in favor of college graduates as the transition to universal higher education for all qualified students is completed and the college degree becomes a credential required at the threshold of good employment (Witmer, 1970, p. 515).

Opportunities for Improving Productivity in Higher Education

Despite past successes, and good prospects for the long run, colleges must continue to give serious attention to productivity during the 20 years just ahead. In the absence of substantial, well-executed adjustments, the impending declines in the traditional college-age population could contribute to substantial increases in costs per student at about the same time that the great numbers of recent graduates experience difficulties in securing employment in positions to which they aspire. Misunderstandings during this transitional period could stimulate decisions of disastrous consequence to many colleges and the students seeking access to them.

Fallacies. In the search for higher college productivity the most delusive goal has been increased quality of outcomes from smaller classes and lower student faculty ratios. This belief in small class superiority is an ancient bit of faith which reportedly originated around the middle of the third century B.C. when a rabbi established the following rule: "Twenty-five students are to be enrolled in one class. If there are from twenty-five to forty, an assistant must be obtained. Above forty, two teachers are to be engaged." Yet hundreds of studies since the turn of the century have turned up no evidence that lecturing to 70 students yields better outcomes than lecturing to 100. Indeed, few faculty get better results with small classes in any mode of instruction (Milton, 1972). Furthermore, there is not evidence in the market for college graduates that anyone recognizes quality differentials related to student faculty ratios. During the 1960s student faculty ratios rose to 20:1 or above in at least 80 colleges and universities with no apparent adverse effect on quality (Behrens, 1972). As Milton concludes, what a student knows is far more important than how many other students learned it at the same time (p. 131).

Closely related to the small class fixation is the conviction that adoption of particular instructional techniques will yield superior outcomes. Some imaginative experimentation with alternate organizations of instruction could result in (a) savings of faculty time, (b) reduced requirements for graduate teaching assistants, (c) lower supply and equipment costs, and (d) reductions in student laboratory hours, but the effects of prescribing particular teaching techniques are likely to be trivial (Heath & Nielson, 1974, pp. 463-484). Dubin and Taveggia re-analyzed data from 91 experimental studies completed between 1924 and 1965 and concluded that teaching method did not make much difference in student learning (Milton, 1972, pp. 21 & 22).

A third will-o'-the-wisp is the perfection of match between student and institution, often expressed in terms of the college environmental press which will challenge students without discouraging them. Although a true test of the theory that students with particular characteristics achieve most in institutions with particular characteristics would probably require the assignment of students to institutions in violation of the students' ancient freedom to choose, institutions have tried to approach this theoretical ideal through selective admissions. Research suggests, however, that superior students are no better off in highly selective institutions than in less selective ones; their intellectual development proceeds equally well in either type of institution. Conversely, the few average or below-average students who manage to enter highly selective colleges do not seem to become unduly intimidated or discouraged, and their dropout rate is only slightly greater than that of typical bright students in such institutions. Chickering went even further in summarizing the results of institutional press: "The Best Colleges Have the Least Effect" (Smith, 1971, pp. 139 & 140). The layer cake model of higher education in which students with high academic aptitude are sent to the top layer of institutions, students with little academic aptitude are relegated to community colleges and vocational schools on the bottom layer, and students with middling aptitude are allowed to enter middle-level institutions is undoubtedly less productive than the model of higher education in which students freely enter the institutions which offer the programs they wish to pursue.

On a seemingly more practical note many institutions of higher education have pursued better physical plant utilization through year around operation with almost no success. The tremendous costs of constructing new academic buildings fade when amortized, and become almost insignificant compared to the faculty staffing costs of year around operation. Failure to recognize these facts carried the University of Pittsburgh to the edge of bankruptcy during the 1960s. The experience of the University of California is well documented; When a full range of courses was offered, costs were high; when course offerings were reduced, students failed to enroll and costs per student were extraordinarily high. In 1970, after years of experimentation, the university dropped year round operation "because it cost too much" (Balderson, 1974, pp. 107-109).

Although there are other notable failures—"economies" in expenditure which result in even greater declines in the value of outcomes, delayed maintenance of physical plant which results in even larger expenditures later, or legislatively prescribed instructional workloads for faculty at the expense of research and public service outcomes—well managed institutions have overcome entrancement with most of these will-o'-the-wisps while concentrating on genuine opportunities to improve productivity.

Shifts to high value programs. Students for many years have been demonstrating that there is as much or more opportunity to improve college outcomes through shifts to higher value programs as there is opportunity to reduce the cost of required resources. Indeed, this continuing modification in program offerings is the predominant source of higher education's high level of productivity relative to that of other private and public enterprises. As Bowen and O'Neill testify, costs have increased (Balderson, 1974, pp. 158 & 196); the values of outcomes, however, have increased as much or more! This productivity promoting process will continue as long as students can choose programs and institutions, i.e., unless students are compelled to attend particular institutions and required to pursue prescribed courses.

Phasing out and closing down marginal programs, departments, and institutions follow shifts in societal valuation of outcomes expressed through shifts in student demand. This free market process has operated for centuries and is only slightly modified by extraordinary attempts to sustain geographic accessibility and local pride. Phase outs have been largely limited to the private sector during recent years but will also take place in public higher education as improved transportation and the shift in power from local governments to state governments strengthens the hand of statewide planners. The productivity of higher education in many states will undoubtedly be increased as limited resources are concentrated in fewer institutions (while equitability of access declines).

Within institutions, however, the elimination of programs and departments does not necessarily lead to higher productivity. Operating on a last in, first out basis, institutions under financial pressure sometimes thoughtlessly eliminate the new programs and young faculty on whom the destiny of the whole institution depends, while protecting tenured faculty in departments which are only marginally productive. Though analogous departments, e.g., physics, in different colleges and universities produce graduates who are qualitatively indistinguishable, the departmental costs per graduate may vary by thousands of dollars. Thorough analysis and competent planning can provide the basis for departmental consolidation, college reorganization, and, where many institutions are governed by a single board, the transer of tenured faculty to places where they are needed and can be more productive. Whether or not such changes are made depends on the adaptability of faculty and the quality of management. Meeth (1974, pp. 96-98) concluded:

> it is no longer possible to make categorical statements that higher cost means greater effectiveness. . . . It is not so. A single college may spend more and increase effectiveness or spend less and . . . increase effectiveness. It can also spend more and not affect effectiveness at all. This entire study suggests that colleges are more likely to spend more and not add to effectiveness than they are to spend less and detract from effectiveness.

Time shortened degrees, which date from 1640 in this country, when Harvard offered the three year baccalaureate, represent another major opportunity to improve the productivity of higher education. Based on recognition of individual differences in academic aptitude and acquired knowledge, time shortened programs eliminate wasteful duplication for able and experienced students. Early admissions, course compression, concurrent enrollment, and other techniques frequently result in time and other cost reductions of as much as 25% while extending the productive lifetimes of graduates by a year or more (Meinert, 1974). Alverno College in Milwaukee is demonstrating that competency, whether acquired on or off campus, can replace time in class as the measure of progress toward a degree.

Externalizing higher education through internship, correspondence, radio, television, library, and newspaper study, which shifts major responsibility from instructor to student, holds great promise of improving the productivity of higher education (Watson, 1975, p. 18). Time, location, and progress flexibility have made external programs attractive to millions of motivated, mature students since the work-study concept was introduced by the University of Cincinnati in 1906 (Fowler, 1972; Lewis, 1974). Although American colleges and universities have over 60 years of experience in external programming, the outstanding contemporary model is the British Open University which is operating at approximately one-third the per student cost of traditional institutions. It is being emulated by the University of Houston, Rutgers, the University of Maryland, the Union for Experimenting Colleges and the University of Mid-America in Iowa, Kansas, Missouri, and Nebraska, and others (Mayeske, 1974). External programs will undoubtedly grow in importance as agents of equity as well as efficiency.

Consortia and external resources. Closely related to external programming is the use, by traditional colleges, of resources located in neighboring institutions and in the surrounding community. When survival is at stake, and under less pressing circumstances, colleges and universities have discovered that inter-institutional planning, purchasing, computing, food service, health service, housing, television, libraries, insurance programs, auditing services, and even the joint appointment of administrators and teaching faculty can improve productivity by reducing costs without sacrificing the quality of outcomes. Oxford and Cambridge in Enrland, the Calremont Colleges in California, and the Five Colleges in Massachusetts are examples of consorting institutions. President Hruby (1973) of Acquinas College provides a delightful description of attempts to broker adjunct faculty and other community resources to meet college and community needs. The University of Wisconsin-La Crosse sells academic computing to six other institutions, buys day care services from Western Wisconsin Technical Institute, uses adjunct faculty from local clinics and hospitals, regionally plans academic programs as part of the West Central Wisconsin Consortium, offers joint courses with Viterbo College, programs off-campus courses with the University of Wisconsin-Extension, participates in large scale purchasing through the Wisconsin State Department of Administration, and, under the Minnesota-Wisconsin Compact, enrolls Minnesota students in its programs while Wisconsin students enroll in programs at nearby Winona State College in Minnesota. The impact of any one inter-institutional project is likely to be small; the cumulative impact of sharing resources can be great.

Faculty initiated curricular reform ranks much lower as a productivity improving opportunity than the student-induced shifts to higher value programs described above, not because the effects on productivity are less dramatic but because faculties almost never reform themselves. Behrens (1972, pp. 41 & 42) has estimated that implementation of the eclectic curriculum designed by Bowen and Douglass (1971) would yield reductions of from 16 to 55% in direct costs of instruction in typical liberal arts colleges. Bowen and Douglass (1971) estimated the relative costs of a number of different curricular plans for a hypothetical college roughly comparable to Grinnell College or Pomona College:

Standard	1.00
Ruml	.49
Bakan	.96
Kieffer	1.16
Eclectic	.80

If all of these plans are in use, at least experimentally, in many colleges and if the quality of outcomes is neither imagined nor perceived to be different, perhaps faculties will arrest the proliferation of courses as an alternative to allowing their institutions to go out of existence and higher productivity will result.

Faculty augmentation and transformation. Faculty are higher education's central, most valuable, and most expensive resource. More productive use of faculty can be achieved in various ways: first, by allocating faculty responsibilities in accordance with special abilities; second, by using technicians, faculty assistants, student advisors, tutors, evaluation specialists, and other less costly support staff to perform less demanding tasks; third, by providing audio-visual, television, computer, library, and other academic support services to augment faculty efforts in classes and laboratories; fourth, by developing faculty as learning facilitators.

> An institution should demonstrate its commitments to effective instruction . . . standards and the spreading of the gospel. . . . [Learning facilitators] should be appointed, and among their responsibilities for mobilizing their institution's total instructional resources should be the concern for the effective utilization of technology. Under their auspices, information about instructional technology should be maintained and made available to faculty members. They should arrange training sessions for faculty members interested in developing learning materials that utilize advanced media and procedures. They should serve as campus liaison with governments, foundations, and other sources of financial support for introducing promising innovations in the utilization of new media and techniques. They should assume responsibility for identifying effective uses of technology on campus and, when appropriate, for calling it to the attention of the total faculty and of regional, national, or professional organizations engaged in the development and distribution of educational materials. (Carnegie, 1972, p. 50)

The accumulative effect of faculty augmentation will be actualization of the fourth revolution in education and the transformation of the faculty from lecturers, demonstrators, discussion leaders, and laboratory supervisors to designers of learning experiences.

Summary. The productivity of higher education is uder the scrutiny of students, trustees, governors, and others who evaluate outcomes relative to costs. They find that higher education is more productive than other private and public enterprises and well worth the sacrifice of the immediate consumption of other goods and services. The unresponsive and poorly managed programs, departments, and institutions slip to the margin, are phased down, and are put out of existence. Institutions which eschew investments in small classes, year around operations, and other will-o'-the-wisps, while exploiting productive opportunities which increase the value of student-embodied competencies to create and produce, have survived and, during the last quarter of this century, will prosper.

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LET THE BUYER BEWARE:
EDUCATIONAL INNOVATION and CONSUMER PROTECTION

Claudine Schweber-Koren,
National Institute of Education

Two recent developments in higher education may be headed for collision: consumer protection and educational innovation. While this is presently somewhat far off, current developments in each area which could make for conflict are already identifiable. Such a conflict could adversely affect innovation.

Educational Consumerism

A new consumer movement exists in which institutions are perceived as sellers and students as buyers of an educational service (Proffitt, 1974). It has been growing since the early 1970s, having been given impetus by a general rise in consumerism on the one hand, and some shoddy educational practices on the other (Arnstein, 1974b), at a time when career preparation is an important goal of many college students (Yankelovich, 1973). The tightening economy has more students concerned with output—getting a job. Institutions which seem to promise that are blossoming. Anxious students are sometimes not very careful about investigating the claimant. Diploma mills, proprietary institutions which promise jobs and lifetime placement, schools which close soon after tuition has been paid or loans taken are the most notable offenders (Arnstein, 1974a, 1974b). One strategy for dealing with this problem has been to give students more power over the educational system. In 1972 the federal government shifted its student assistance funds from institutions to students through the Basic Education Opportunity Grants (BEOG), state Student Incentive Grants and federally guaranteed student loans. Thus, student choices can more directly affect institutional operations. The Federal Interagency Committee on Education (FICE), which represents 29 agencies and departments, created a subcommittee on Consumer Protection in Education in 1972. They recently issued a report with recommendations for federal action (Proffitt, 1974). The report enunciates principles which "solidify" the notion that:

> The student is the primary consumer of educational services. As a result of educational inexperience coupled with the expensive nature of the services (she or) he is purchasing, and in light of the potential for consumer abuse . . . the educational consumer . . . has responsibilities (and) consumer rights. (pp. v-vi)

So here we have a situation in which the student-consumer wants details and guarantees about the educational services she/he may purchase. How does this relate to innovation?

Arnstein (1974a, 1974b), in a series in *American Education,* points out that legitimate ventures, such as a university without walls can "look and sound uncomfortably like a diploma mill" (1974a) with unusual courses, credit for mobile or adjunct faculty. Thus, the superficial similarity between legitimate innovations and huckster-today/gone-tomorrow operations only complicates the student-consumer's selection process. It may also have a chilling effect on continued participation in innovative programs in legitimate, traditional institutions. For who knows how an employer or graduate school will look at those strange courses or unusual programs?

It is precisely this point—the risks of participating in legitimate innovation—which must be examined before connections with the new consumerism can be made.

Educational Innovation

College curricula, one educational service, has also been changing. Many universities have recently developed more flexible undergraduate programs. Although the programs vary with the institution, all basically allow undergraduate students varying degrees of freedom to design their own curricula (Givens, 1972; Stevens, 1970; Arnstein, 1974a). For many students the process of designing and implementing such a program enables them to focus on post-baccalaureate goals. Often this includes graduate or professional school work.

Although educational institutions make no employment or graduate school promises, students in traditional programs can assume that their curricula is at least comprehensible to "outsiders"—employers and graduate admissions personnel. Very little research has been done on the reaction of these "outsiders" to students with innovative, particularly self-designed, programs. Do they even know about or understand these new options (Schweber-Koren, 1973)?

One study of the graduate and professional school reaction to potential applicants with innovative/special-degree baccalaureates has been done (Schweber-Koren, 1973). It explored whether such students would be admitted to a graduate/professional school and under what conditions. What kinds of information, beyond the standard application, must the student supply? The study was done at the State University of New York at Buffalo campus in 1972. Since it is a major state university center, the results should at least be applicable to similar units. The following will briefly highlight some aspects of that study with an eye toward the implications for educational consumerism.

At the State University of New York at Buffalo, the special-degree program is called a special major. It enables a student to design her/his own major when the course of study which the student wishes to pursue does not exist among the regular university departmental offerings. The program requires two faculty members to serve as sponsors and guide the student in the design and implementation of the project. Approval is granted by the Dean through the Special Major Committee.

Between 1969 and 1972, 136 such majors were approved, each year in greater numbers. While there was a

Table 1

TO WHAT EXTENT IS THE CONTENT OF STUDENTS' UNDERGRADUATE PROGRAMS CONSIDERED?

Opinion	Total (53)		Humanities (8)		Social Sciences (19)		Science & Math (18)		Professional Schools (8)	
	#	%	#	%	#	%	#	%	#	%
Very Much	23	43	3	37.5	4	21	15	83	1	12.5
Some	28	53	5	62.5	15	79	3	17	5	62.5
Not at all	2	4							2	25

definite interest in Urban Affairs, Ecology and Law, programs varied with student-faculty interests: Communications and the Arts, Brazilian Studies, Women and Prisons, Drug Counseling, etc. (Indeed, the Special Major has been so successful, that a new degree, a B.A. in Social Sciences with a focus in Urban Studies and Legal Studies has just been approved at SUNY/Buffalo.)

In October 1971 a questionnaire was sent to the admissions directors of the 58 graduate departments and professional schools at SUNY/Buffalo. A total of 53 (91%) completed the questionnaire: 8 humanities, 19 social sciences, 18 science and math, 8 professional schools. They were asked about general admissions criteria, about the reaction to special major applicants, about admissions personnel's feelings toward non-traditional courses, and non-traditional grading. The results were assessed in the spring of 1972.

For the present discussion, the relevant findings are, first, that respondents agreed that the content of the applicants' undergraduate program is a key factor in admissions decisions (also Table 1).

This is particularly important for special degree students since it is the uniqueness of the program which distinguishes such students from each other and from students with standard-traditional programs.

However, an understanding of the differences, and presumably the merits, of a student-designed program versus a standard (university-designed) program were only beginning in 1972. Furthermore, there were no institutionalized mechanisms for communicating the unique programmatic content and its worth to the admissions people. Consequently, unlike traditional programs, the responsibility for legitimizing and selling the innovative package is the student's. The institution (that is, SUNY/Buffalo) did not participate in this process other than to indicate by attaching its name to the program that it approved of such endeavors.

A side-effect of this situation is that the reputation of the undergraduate school rather than the substance of the innovative program dominates the attitudes toward that program. (See Table 2).

These respondents checking "considerably" and "somewhat" (77%) represented almost four times as many as the number who made no distinction (19%) between special and standard program applicants' undergraduate school. It can be inferred that when the institution makes no special effort to sell the value of its innovative programs, unless the student does so, the worth of the program is often that of the institution.

Another finding related to the above is that the independence and creativity a student showed in designing such a program, while admired, would not substitute for competency in three general areas: overall average, letters of recommendation, and standardized exams. Eighty percent of the sample felt this way. This means that the non-traditional applicant must first defend her/his project as academically sound by successfully competing with others on general standards, and then take the initiative in communicating the particulars of the program.

Table 2

EFFECT OF THE REPUTATION OF THE UNDERGRADUATE SCHOOL ON THE REACTION TO A SPECIAL (STUDENT-DESIGNED) PROGRAM

	Percent
Effect	%
Considerably	40
Somewhat	37
Not at all	4
As much as in the case of an applicant with a standard program	19

Admissions personnel were eager to receive program details and faculty evaluations (see Table 3). This may be due to a hesitation articulated by some, particularly in the sciences, that the lack of evaluation criteria for non-traditional programs makes them more wary of these unusual endeavors. "What is needed," one person wrote, "is a pattern for (evaluating special) students for whom the documentation, while different, is as convincing as that provided by the conventional patterns" for traditional students.

The message then, was that lack of familiarity with the special program, lack of evaluation criteria, and some suspicion about applicant preparedness means additional responsibility for innovators: selling the worth of themselves and their degree.

Consumers vs. Innovation?

In light of the growing movement toward notifying the educational-buyer about the contours of the service she/he may purchase, how can the additional (student) responsibilities and risks of innovation be ignored? If the institution is not an active

Table 3

INTEREST IN RECEIVING PROGRAM DETAILS AND EVALUATIONS

	Yes	Perhaps	No	Yes + Perhaps
Would you like a copy of the program? Total = 53	38 (72%)	12 (22%)	3 (6%)	50 (94%)
Would you like letters from sponsors commenting on the program and the student (separate from letters of recommendation)? Total = 53	40 (76%)	8 (15%)	5 (9%)	48 (91%)

"salesperson," should not the student be informed of the added burden before selecting that option? Might the student-consumer have a legitimate grievance and any redress when she/he finds out?

Educational innovation is expanding at the undergraduate level. The *Yellow Pages of Undergraduate Innovation* (1974) lists 3,000 entries. Certainly there is still student-faculty interest in this area.

In order to honestly respond to the educational consumers, two steps must be taken now: additional research on the reaction to undergraduate innovation and institutional activism on behalf of non-traditional programs.

Most of the research in educational innovation has focused on the programs rather than the aftermath (Dressel & Thompson, 1973). Studies on employer reaction do not appear to exist. Research on graduate/professional school attitudes needs updating and expansion. With a more definitive sense of what the impact is, perhaps the institutions will feel less hesitant, and less defensive, about an offensive campaign in favor of their innovations. Such openness should also establish more clearly the differences between the innovations of legitimate institutions and that of the hucksters.

In our multicredentialed society, the educational responsibility of an undergraduate institution must extend beyond the baccalaureate level. Open, aggressive support for unusual programs may also be a powerful recruiter. Support for this view comes from the example of a newly established law school. Although this is an advanced degree institution, the direction it took is an appropriate analogy. Antioch Law School in Washington, D.C. is not only new, but very different. Since its beginnings in 1972, its creators and members have aggressively promoted their unique non-traditional law program. It has just been granted full accreditation, barely two and one-half years after opening; applicants are as numerous as to more established and prestigious law schools; placement, they claim, is not a problem.

Without such strong institutional support, the tightening economy and its correlate, a job-related-education, could easily deter participation in innovation. If the consequences of non-traditional programs are not spelled out and the programs not supported, the students may not take the implied risks. The trend toward shifting some financial control to the buyer gives the prospective student greater bargaining power. Some may choose a different school altogether. And if there are few customers, how long will the institutions provide the innovative option?

Educational consumerism has just begun and appears to be getting plenty of support from Congress, the federal government, and student lobby groups. If innovators begin now to deal with the challenges, they should at least be in step.

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PUBLIC OPINION RESEARCH: QUICK, BUT NOT SO DIRTY

Patrick T. Terenzini,
Syracuse University

Consider the following:

1. A university is experiencing heated debate on whether the Reserve Office Training Corps (ROTC) should remain on campus. Students and faculty members opposed to ROTC are lobbying hard for its expulsion and representing their position as the prevailing campus opinion. A campus-wide information poll, however, reveals that the majority of students and faculty sampled want ROTC to remain, in some form, and a compromise is worked out. Thus, a divisive issue is defused when sufficient and timely information is obtained.

2. It is mid-October and the Dean of the College of Arts and Sciences in a large university has named a committee of senior faculty members to review the academic experiences of freshmen and to suggest ways of improving the academic program—all by early January. A survey of all students reveals dissatisfaction with academic advising, the level of student participation in academic decision-making, and the level of intellectual stimulation students provide one another. Faculty members are also found to be dissatisfied with academic advising, as well as with the level of non-classroom student-faculty interaction and with what they perceive as the administration's lack of commitment to the quality of academic life at the university. The information pertinent to Arts and Sciences, disaggregated for students by sex and class level and for faculty members by academic rank, is in the committee's hands by mid-November.

3. The Division of International Programs Abroad is asked by the Vice Chancellor for Academic Affairs to determine in three weeks what proportion of freshmen and sophomores in the College of Arts and Sciences might be interested in a program of study in Spain. The information is delivered on time.

None of these situations is hypothetical. All occurred at Syracuse University and, in all instances, public opinion research techniques were employed to provide the information needed.

Design

The Syracuse University Opinion Poll, established in the fall of 1973 by the Office of Student Affairs and the Psychological Research Center, is designed to sample reliably and quickly the opinions of students, faculty members, and administrators on a wide variety of issues important to the university community and to decision-makers. The poll has two purposes: (a) to serve as a communications device—a means of keeping members of the university community informed about the opinions of others; and (b) to contribute information on campus opinions and attitudes to debates and decision-making.

Simple random samples are drawn by computer from the populations of students, faculty members, and administrators. For each poll, 400 students (2.5% of the population), 86 full-time faculty members (10% of the population), and 30 administrators (38% of the population, as operationally defined) are selected for participation. Data are gathered over the telephone by trained student interviewers and are processed by optical scanning techniques.

Following analysis of the data, a description of the poll's results is distributed to campus, local, and national media. Results are routinely forwarded to all members of the Chancellor's Cabinet and to administrators, faculty members, and student leaders in areas touched on in poll questions. In all cases, the entire process—from question development to results—is carried out within ten days.

Clearly, the speed with which data can be gathered is contingent upon the accessibility of several resources. Student and faculty data files must be up-to-date (especially telephone numbers) and must be set up for computerized sampling. Trained interviewers and money to pay them, when necessary, must also be available (the Syracuse Poll uses 15 interviewers at the rate of $2.36 per hour). Optical scanning equipment is a great advantage, although not essential.

Assets

The most obvious advantage of the poll design is the quick access it affords to information. Once the organizational machinery is in place—and assuming that lengthy written reports are not required—information turnaround can be even quicker than the ten-day schedule on which the Syracuse poll operates.

The fact that a college or university community generally maintains complete data files on its members (frequently in computerized form) permits rapid sample selection. Since the distribution of demographic characteristics within the three populations (students, faculty members, and administrators) are known, tolerable sampling variances can be specified and samples can be chosen through simple or stratified sampling procedures. Having sampling information on the population in readily available form is not, to be sure, an asset limited to the research design suggested here. It does, however, permit rapid and flexible sample selection without resort to the more cumbersome, time-consuming and expensive cluster sampling techniques characteristic of nationwide opinion polls. In addition, computerized probability sampling clearly elevates the poll design outlined here from the "man in the street" genre, and the generally complete telephone networks of higher educational institutions preclude any recurrence of the *Literary Digest* disaster.

Another advantage of this design is its generally high response rate. Response rates typically fall in the 70-80%

range, but have gone as high as 82%. Such high rates not only hold sampling error variance near its specified theoretical limits, but also virtually assure the representativeness of respondents. These rates also greatly reduce the cost per contact.

Polling can be relatively inexpensive. The principal cost is interviewers' wages, which may vary considerably, depending on how interviewers are recruited and how they are paid. When interviewers are students enrolled in courses in interviewing techniques (and therefore receive academic credit), or are eligible for College Work-Study Program assistance, wage expenses can be low. When interviewers' wages must be paid wholly from a research account, the cost may be prohibitive.

Using 15 student interviewers to contact approximately 516 sample members (with response rates varying from 68 to 82%), total interviewers' wages have ranged from a low of $297 to a high of $518. But never have all of these dollars been "out of pocket" from university accounts; various combinations of students doing the interviewing for academic credit or working under the College Work-Study Program have meant direct wage costs to the institution ranging from a low of $102 to a high of $431, or $.23 to $1.10 per respondent.

It is difficult (and perhaps unwise) to try to compare direct costs of telephone and mail surveys, but mailing a questionnaire to a sample of comparable size and its follow-up might cost $200 for postage, materials and printing. Assuming a 50% response, such a mail survey yields a cost rate of $.80 per respondent. Rossmann and Astin (1974, p. 276), discussing cost analysis associated with the Cooperative Institutional Research Program of the American Council on Education, report cost per response rates ranging from $1.02 to $1.83, depending upon the survey techniques employed and postal rates.

Additionally, time and materials costs are slightly lower under the poll design than for mail surveys. Telephone interviewing requires fewer materials, less material-preparation time, and less report-preparation time than do mail surveys. Machine scoring and computer costs are about equal for both designs.

Thus, the cost per response—which might be viewed as an index of the effectiveness of the money spent—tends to be lower for the design outlined here than for mail surveys. To be sure, one "pays" for telephone interviews in other ways, as will be seen below.

In addition to the advantages of quick information turnaround, the integrity of the sampling design and its flexibility, high response rates, and generally low unit costs, the design has a variety of institutional research applications, one of which is serving an exploratory research function by helping to identify issues which may require more detailed analysis. It can operate as an "early warning defense" system when used an an evaluation tool to monitor the operations of institution-wide programs and services. Because of the ease with which target populations can be redefined, the design also affords a quick, relatively easy way of evaluating programs or services which serve subsets of the institutional community.

Secondary benefits related to this design include the promotion of community morale. Students, faculty members, and administrators like to be asked their opinions, to see poll results, and to know that their opinions are reaching decision-makers. The polls provide a voice, in particular, for groups which may feel disenfranchised or isolated from the decision-making process.

When student interviewers are employed, the poll also is a means of providing financial assistance. In addition, the poll gives institutional researchers an opportunity to develop working relationships with faculty members who teach courses in interviewing techniques.

Liabilities

But, as everyone knows, "there is no such thing as a free lunch." Information complexity and depth are sacrificed in the quick, if not so dirty, telephone survey. Because respondents only hear the questions, the number and nature of the questions must be limited.

The Syracuse poll typically poses no more than a dozen questions. The respondents' attention spans preclude more detailed questioning. Because the questions are verbal, and the interviewer may have to repeat them, it takes time for a subject to comprehend what is being asked of him. Nor does the design let the subject choose when he will respond. While one of the assets of this design is the probability of contact with a large proportion of the sample, the other side of the coin is that the contact may come at a time the sample member has reserved for other activities, thus abbreviating the time and attention he may be willing to devote to poll questions.

Similarly, the number and variety of response options are limited. Each time the response option format is altered during the interview, the respondent will need time to adjust to the new alternatives. A 5-option scale is probably the workable maximum. Whenever possible, response options should be consistent for all questions, although two (possibly three) scales may be used, if the variations are simple.

These restrictions, inherent in the design to a large degree, open the poll to criticisms of instrument reliability. The relatively small number of questions which can be asked limits opportunities for determining the internal consistency of the instrument. Indeed, most of the standard procedures for determining the reliability of measurement cannot be applied to instruments used in this research design. In addition, time for instrument development and pretesting is generally limited. Thus, issues of instrument reliability conflict with the poll's chief attraction—quick information collection.

Polling is as susceptible as standard survey techniques to other questions of reliability. One such issue is the honesty or integrity of respondents in answering questions. While anonymity and confidentiality are promised by the interviewer (response sheets bear no identifying marks beyond demographic data), certain respondents (or responding groups) may perceive personal advantages in answering certain, especially politically sensitive, questions in ways at variance with their personal beliefs or attitudes. Results also may be biased by the resistance of some respondents to answering questions over the telephone (although there has been little indication of this at Syracuse). The student-status, sex, or "telephone manner" of the interviewer may also bias the data in unknown ways.

Some of these problems can be overcome (or minimized) by careful training of interviewers and by cultivation of a reputation for professionalism and objectivity on the part of interviewers and researchers alike. But ultimately, such liabilities of the design must be recognized and kept in mind.

Questions of validity must also be addressed. Personally, socially, or legally "loaded" issues probably cannot be adequately addressed in a telephone survey. For example, studies of the extent of drug use on campus, racial or sexual attitudes, or similar issues would be difficult enough to assess when anonymity and confidentiality could be guaranteed. Fortunately, opinions on many issues for decision-making are less personal and ones with which the poll can deal.

But perhaps the greatest threat to the validity of this design is carelessness in the development of the questions. The limitation on the number of questions which can be asked influences how the questions are phrased, and phrasing, clearly, is critical to the validity of the responses. Omnibus questions may yield response distortions.

Summary

The design discussed here is not a replacement for more standard survey research procedures. Subject to many of the same limitations of the standard techniques, the telephone design is further limited in the number and nature of the questions which can be asked, as well as in the complexity of the areas which can be examined. Instrument reliability and validity are open to question and opportunities to control them are limited. Initial organization of the data collection machinery can be as time-consuming as preparing a mail survey.

Once the machinery is set up, however, the design has clear assets. Information turnaround is obtainable within a ten-day period, sampling integrity is maintained, response rates are generally high, and costs per response are generally lower than standard survey research designs. Additionally, the design has a wide variety of applications, as either an exploratory research tool or as an evaluative device, without substantial time commitments.

While such a design will never replace more conventional techniques, when information needs are urgent—as illustrated in the opening "real life" examples—the research design outlined here has compelling advantages for institutional researchers. It is quick, and really not so dirty.

Rossman, J.E., & Astin, W.A. Cost-effectiveness of differential techniques for mail questionnaires. *Research in Higher Education*, 1974, 2 (3), 273-279.

RESTRUCTURING POSTSECONDARY EDUCATION

B. Everard Blanchard
Villa Educational Research Associates

Higher education today is on the threshold of a scientific and technological revolution. What is necessary at the moment may be expressed threefold, namely:

1. We need to implement action programs centered on human energy so that it may be channeled intelligently. We need a system of national education which will be oriented toward all American citizens so as to assist them to realize their maximum potentials socially, morally, emotionally, mentally, physically, and spiritually.
2. Reputable research has suggested that we develop a new structure which may be compatible with the needs and interests of society. A careful analysis of the unemployment situation, the mounting poverty and crime rates, the ever-increasing number of individuals composing the relief rolls, the almost complete lack of articulation between business-industrial opportunities and higher education and we see American education facing a gigantic task if we are to reach all American citizens.
3. Such a program as indicated in items 1 and 2 will require an educational leadership—which consists of insight, understanding, experience, and training. Little, if any, such leadership is exemplified in many institutions of higher education.

What Does Research Tell Us?

Training for the unemployed and for the potential dropout is basically one problem; educators must consider both in treating one.

This was further highlighted by the *National Committee on Employment of Youth Survey* (Fine, 1962):

1. More coordination is needed between schools and industry on what the curriculum should be. Millions of boys with fine manual talents are being lost to the ranks of the unskilled and employed at the lowest classifications because schools offered them only academic courses for which they were unsuited.
2. Students should be taught to be realistic, and schools should have job guidance programs.
3. The traditional type of education is not working for those who are not from middle class backgrounds and who have language difficulties.
4. Schools should not wait until junior high school before identifying and helping the students who may become dropouts.
5. There is an increasing demand by industry for training—beyond high school to qualify for employment.

In a national survey directed by the writer (Blanchard, 1971), the findings revealed that from one-third to nearly one-half of the courses taught in the high school, namely, English, social studies, science, and mathematics are repeated identically during the freshman and sophomore years in the college or university.

- In addition, the college freshmen and sophomores paid tuition fees amounting to $420,492,375 for courses they had already taken during their junior and senior years of high school for which their parents had already paid an estimated $500,000 in taxes to the local school district. These financial figures are for 1965-66; imagine what the costs might be during 1975-76!

Can we assume that this degree of overlapping at the college level represents prudent administration? And, viewing this from another angle, we note that the high school students are taking the courses for credit toward a high school diploma while college students taking the identical subjects are receiving credit for the baccalaureate degree. Can we then assume that the high school diploma is equivalent to the B.A. or B.S. degree?

The Carnegie Commission on Higher Education has stated that we can eliminate one year of college without sacrificing quality of instruction. The writer suggests that we can abandon the first two years of college without disturbing the quality of instruction. Since the first two years of college are usually associated with general education in the four-year college, general education rightfully belongs to the secondary school. With the community college absorbing students who might otherwise attend the four-year college and with the graduate school dipping down into the last two years of the liberal arts college, just where does this leave the traditional liberal arts college? The writer predicts that by the year 2000 the college of liberal arts, as we know it today, will be as extinct as the dinosaur we used to see at the local Sinclair stations throughout the country.

> Astin states (1969) our findings seem to have several implications for planning. They suggest that it may be wise to reexamine traditional notions about institutional excellence, particularly as it relates to the intellectual development of students. The pursuit of bright students, more money, better libraries and physical plants, more Ph.D.s on the faculty, and other traditional indices of quality will not necessarily produce a better environment for learning. (p. 31).

Another implication for planning concerns the general question of admissions. Selective admissions policies cannot necessarily be justified on the grounds that they create an environment which is more conducive to student achievement. Thus, institutions that wish to modify selective admissions policies and diversify their student populations can do so without the fear that the achievement of their brightest students will suffer as a consequence. By the same token, the data suggest that the less able student will not necessarly wither and die

Figure 1

CAPACITY TO LEARN VERSUS QUALITY OF ACHIEVEMENT*

Level	Grade	Number of Students	Correlation	Significance
Primary School	1-3	1000	.81	.001
Intermediate School	4-6	850	.70	.001
High School	9-12	1200	.62	.001
College	13-14	1325	.51	.001

Source: Blanchard, B.E., A comparative Analysis of Primary, Intermediate, Secondary, College, and University Levels in Aptitude Versus Achievement, 3rd Interim Report, Chicago, Ill.: DePaul University, School of Education, graduate Programs Office, 1971.

when confronted by the overwhelming competition of a selective institution. The widely held belief that only the highly able student can profit from being exposed to the center of excellence is not confirmed (Astin, 1969, p. 32).

A major reason why restructuring postsecondary education is unavoidable is the plain fact that college and university students are using but 15 to 20% of their potential mental maturity and wasting from 70 to 80%. Figure 1 illustrates this very clearly.

The inferences as might be drawn from Figure 1 appear to indicate that children in the primary grades make the greatest use of their ability to learn, whereas college students make the least of their ability to learn.

If the basic purpose of administration is to facilitate instruction, a woeful deficiency of purposeful administration is missing in higher education today.

Educational leadership appears to be the top issue in elementary and secondary schools, as well as in universities and colleges. In reviewing the responses of approximately 5000 educators in 41 states on the 3 levels as indicated, the majority of these professionals believe that the key to partially solving problems in higher education reclines in the office of the administrator, or the President and various Deans of Schools of Education (Blanchard, 1972).

The downward extension of subject matter during the past three decades has had a tremendous impact on the learning abilities of youth. For example, foreign languages at one time reclined solely in higher education; today, we may find numerous elementary schools throughout the country offering foreign languages at the primary level. Science, industrial arts and mathematics are other subjects which now receive a great deal of emphasis at the elementary level.

A New Design for Postsecondary Education

By the year 2000 the traditional liberal arts college, as we know it today, will have disappeared. A new structure will make its appearance which the writer would like to call the "multipurpose college." This structure will provide opportunities for all American citizens and will grant the first two years of college free from tuition, the major expense being borne by the federal government. The hypothesis of the last statement is based on the supposition that boosting the learning capabilities of American citizens will mean a more productive work force for the future years. Briefly, such a venture would actually stimulate the quality of human capital.

In this novel design offerings will include scientific and technological training, career training, professional training such as law, medicine, dentistry, teaching, etc. Adult and continuing education are also aspects which will receive due attention.

If we desire to decrease the unemployed, diminish the ever-increasing relief rolls, eradicate the crime and poverty rates, and regain an economic stability, we must restructure our educational system.

Figure 2 represents the author's conception of a "multipurpose college."

Adult education and continuing education would be offered to all American citizens. As one may note, we are graduating prospective teachers at an earlier age, with the student bearing but 50% of the total cost. Under such a plan, the federal government would finance the system at the 60 to 70% level, the state at the 15 to 25% level, while the local school district would pay less than 10%. Local autonomy within each state would be stressed.

If self-respect and economic security are to be emphasized in our society, and I am quite positive they will continue to be vital motivating factors in human living, our educators will have to eliminate the lag in our educational system and adapt it to the manpower needs of the future. A student who has been taught a skill that is no longer needed will be starting on his career equipped with no more than a piece of parchment. In fact, we have many prominent and notable educators who believe that workers of the next 10 to 20 years will have to return to school from time to time to keep pace with the new competencies and skills required.

No matter what issues we examine or how we may alter our educational training and thinking, it is work that gives life meaning in our society. Therefore, unless we want to change our social system, we must prepare the student, the worker, and the unemployed for work and thus give them the challenges and the opportunities that can make their lives meaningful and purposeful.

Figure 2

THE MULTIPURPOSE COLLEGE

Grade	Age	Interpretation
11	16	What is currently the last two years of high school would become the first two years of college.
12	17	An Associate Certificate, or degree might be granted. Teacher training would begin the first year and be four years in length with internships and residencies.
13	18	A teacher would receive the baccalaureate this year, but would continue the fourth year. This year would have to be paid for by the student.
14	19	The fourth year would grant the masters degree, thus the prospective teacher would have twice the amount of training they presently receive.
15-16	20-21	Teachers would have to complete one year of an internship on the level he or she was qualified to teach. Also, one year as a resident teacher would also be required. Both the intern and resident year would be "student teaching." Teachers would be paid like the interns and resident M.D.s and D.O.s are paid.

Astin, A. W. New research has implications for academic planning and the quest for "excellence." *College and University Business*, 1969, p. 31.

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Fine, B. Spotlight on education—dropouts pose national problem. *The Newark Sunday Star-Ledger*, December 16, 1962, Section 4.

ORGANIZING THE MARKETING FOCUS IN HIGHER EDUCATION

Eugene H. Fram, Rochester Institute of Technology

In a time of academic retrenchment, it may seem surprising to suggest the creation of a new top level staff position in the academic structure, which is the purpose of this article. The suggestion, however, is based on recent findings from a multi-institution pilot study conducted by the author.[1] It appears from the research work that marketing efforts in the college and university environments are not being maximized because they are not properly integrated and coordinated. There should be a growing demand at colleges and universities from a person to perform these functions.

Marketing in Higher Education

The process of utilizing commercial marketing concepts in higher education is a recent one, beginning in 1971. Because of this recent development it is important to describe the objectives of business and academic marketing philosophies.[2] To some, the idea of applying marketing concepts to higher education may be relatively new, and others who have had limited contact with it may mistakenly equate marketing to basic selling.

In the business world the objective of a marketing operation is to enable the firm to understand better its markets and its clients. *It is the business radar which assumes the responsibility for monitoring the realities of the marketplace for those who produce and finance the firm's products.* It helps the firm to locate customer problems which it can solve with its resources and expertise. Organizationally, the marketing vice president supervises the marketing effort by coordinating activities of sales promotion, personal selling, marketing research, etc.

Marketing activity in higher education attempts to develop a similar role in guiding the college or university to become more client-centered. *Through marketing, the college or university develops the philosophy that institutional success is the result of solving long and short range problems for all types of clients.* It is important that client-centered approach be understood in the academic setting. If it is not, marketing will never contribute more than unsophisticated sales techniques to the operations of colleges and universities.

Data for the study were obtained through personal visits to 11 institutions. The findings indicate that marketing functions in academic areas and in administrative departments are being conducted much too separately, often resulting in wasted effort. Unlike the marketing vice president in industry, no one in the administrative hierarchy is assuming total responsibility for integration and coordination toward common goals. This is despite the fact that organizational charts often indicate otherwise. One conclusion stemming from this arrangement is that higher education personnel are trying to meet today's challenges without synthesizing all the efforts of those concerned with helping the institution to understand its client groups.

Under the classical collegiate organization, the President is the focal point for outside relations while the Provost handles internal operations. Inherent in this setup is the assumption that each will integrate and coordinate those activities which fall in his domain to help the institution reach its goals. However, from observations of this writer, things are not working out as the organization plan would indicate.

For example, most of the Presidents included in the study were "admissions oriented." They paid close attention to the admissions department and its operations. It is obvious that admissions is critical and deserves presidential attention. However, it is just one of nine departments or functions identified in the study involved with marketing-related activities. If colleges and universities are to maximize benefits from such departments/functions, they will need more even-handed attention from top administrators.

One surprise finding was that only 2 of 11 schools studied were beginning to think in terms of integration and coordination. As a consequence, Presidents and Provosts continue to be admissions oriented, or development oriented, or public relations oriented, but not marketing oriented. This limited perspective results in situations such as these:

a. Because one publications department did not understand the character of the school's clientele, it produced a group of brochures that achieved no measurable results.
b. Development personnel in one school have approached donors without any significant understanding of the educational programs and priorities of the faculty.
c. One faculty instituted a change in curriculum without any communication with the admissions department.

Following are the nine areas of prime marketing concerns which need to be examined for better integration and coordination.

1. *Admissions* - Seeking new clients.
2. *Public Relations and Publications* - Creating a general image(s) for the institution and assisting others in the promotion function.
3. *Student Retention* - Seeking *underlying* causes for student withdrawal and helping guide those who become dissatisfied with the college or university.
4. *Counseling* - Providing an overall barometer on the state of student morale, attitudes, and beliefs.
5. *Faculty Divisions* - Promoting faculty understanding of student long and short range needs.
6. *Alumni Relations* - Promoting the real interests of an important group of clients neglected by many schools.
7. *Placement* - Finding job opportunities for graduating students and alumni.

8. *Institutional Research* - Conducting studies which help the college/university perceive the realities of the community around them.
9. *Development* - Seeking the added funds from donors who see value in the activities, philosophy, and image of the school.

As indicated before, some of these responsibilities fall under the province of the President and some under the province of the Provost. However, neither seems to be performing the necessary operational melding. The reason is the obvious additional pressures that both these officials face; thus each department/function proceeds independently, much to the detriment of the institution.

The Director of Marketing

To rectify this situation, the author proposes that a new administrative staff position be created. Organizationally, he would be an assistant to the president (or possibly the provost). The administrator would be responsible for filling the coordinating gap. He would attempt to insure that these nine areas are operating with synergism. Possible results include:

—faculty seeking the input of admissions in curriculum development;
—alumni representatives working with admissions in identifying new student groups;
—counseling providing feedback for academic planning;
—a consistent image(s) being developed.

If acceptable within the academic environment, a title of "Director of Marketing" could be utilized. Organizationally placing the Director as a Presidential or Provost's assistant is to attempt to get proper support since it is anticipated there would not be any line authority assigned to him. Line responsibility and authority would be retained in its current organizational mode, with the major benefit of the Director's work being an improvement of interdepartmental interface and overall consistency of purpose. In this relationship, the Director of Marketing would examine the goals of every department as they relate to the eight other areas of marketing concern. Where goals are not congruent, the Director would seek changes or modifications. Since he lacks line authority, his actions would require a high degree of persuasive power and political skill.

It is not anticipated that this position will develop into an operating department because it is viewed as an extension of top administration. The major thrust, of course, is to help the institution focus on its various constituencies more effectively. Years ago the college/university President delegated his internal responsibilities to the Provost, and today there may be a need to handle client-centered functions more smoothly through a Director of Marketing.

The Director's Duties

Results of the pilot study conducted by the author indicated a number of duties which could be managed by the proposed Director.

1. *Marketing research*—In the institutions visited, no central operations existed for conducting marketing research studies to determine: Who is our market? What are the unmet needs of our students and potential students? What is the cause of low enrollment in a particular program? Many faculty and administrators indicated a desire for such information, but institutional research departments did not appear to have a "feel" for this type of study nor interest in doing it. The Director of Marketing would be responsible for these marketing research studies. He would not build a permanent research staff, but this work would be accomplished on an *ad hoc* basis, utilizing external and/or internal resources.

2. *Coordination*—The Director of Marketing would examine operations of all nine areas to develop the coordination discussed above. In the event of disparity between them, he would attempt to moderate the differences using the goals (which hopefully center on clients) of the institution as his yard stick.

3. *The instutional image*—Nurturing the institution's image would be another duty. It is not unusual to find that the institution's professional staff has a diferent perception of the school than those held by clients and others in the community. The Director of Marketing would be responsible for minimizing this disparity and, where it existed, he would make proposals to alleviate the gap. The prevalence of this type of problem was noted even in smaller "compact" schools visited in the course of this study. Internal perceptions of the institution's image frequently differed from administration to faculty and from one academic area to another.

4. *Preparing the annual marketing plan*—Like other activities, marketing takes planning, and an annual plan is necessary to meld the marketing efforts together. It would be the Director's responsibility to develop the plan and to have it reviewed and approved by the policymaking personnel.

5. *An informational source*—The Director would act as a source for disseminating various general types of higher education information within the college/university. This especially critical as institutions in general and academic departments in specific tend to do a poor job, when it comes to communicating with the community around them. For example, the author found some high administrators in the visited institutions knew nothing about the traumatic problems at Southern Illinois University or Antioch. They were relatively oblivious to the current problems related to the "health" of higher education. It would be the job of the Director to keep a constant flow of external information moving through the institution.

6. *Enrollment forecasting*—This aspect of college and university management is most difficult even in more placid times, let alone the current traumatic period. As administrator responsible for outside market contact, the Director of Marketing could provide valuable inputs for the forecasting process. If enrollment forecasting were not centralized in an institution, the Director might assume total responsibility for it.

What Type of Person?

If the college or university were to obtain the best return from a Director of Marketing, the job must be filled with a person who has stature and drive. The Director must be highly task oriented and at the same time must be sufficiently persuasive to bring the various departments and functions together. Since the position is a staff one, he will have only referent power through his relationship with the President or Provost.

It will not be an easy position to fill as there is no career path involved and one encounters the classical confrontation of having responsibility with little authority, i.e., he will have to coordinate the nine areas but will have no formal power. Job satisfaction to the incumbent will be derived largely through seeing the long range marketing plan of the school evolve and the institution become attuned more finely to outside concerns.

As a result, the job might challenge an experienced administrator who has decided he is no longer interested in a presidency and views the job as a final one covering a 10-15 year span prior to retirement. If the position were filled by a person intent on building a large staff of subordinates, the possibilities of conflict with operating *department heads would* be considerable.

Possible Objectives

Since this is a new concept for higher education, a number of objections can be raised. First of all, the job does not *directly* contribute to the education of students and cost must be considered in this light. But hopefully it will be indirectly beneficial to students by fostering a more current and more efficient organizational setup that is student centered.

Another objection would be that it is not viewed as a position which has long range career benefits, yet the demands on the incumbent would be considerable. It would require an unusual person, but each college/university would only require one position. Consequently, the limits on position expansion nationally are quite narrow.

Financial remuneration should be high in order to attract a capable and ambitious person. Possibly the salary category should be near the top of the administrative schedule for the institution. However, goals and objectives need to be established and productivity should be carefully monitored from the start. If these are not established, as a staff job, it would be easy to have it drift ineffectively along.

An Industrial Counterpart

Industry has a position which is reasonably analogous to the college or university Director of Marketing. This is the product manager. The product manager is used in multiproduct companies to coordinate various business activities (e.g., selling, display, advertising, product scheduling) for a specific product. Prior to the development of the product manager concept the top marketing person was responsible for all products, and the growth of the number of products finally made his job much too involved to the point that he could no longer coordinate the functions of advertising, selling, etc. As a result, for example, the production department might not produce enough production units to meet the advertising plans established by promotional personnel. Today, it is the job of the product manager to bring the different functions together, e.g., to make sure that advertising is not wasted because of insufficient production.

It must be acknowledged that the product manager system has not worked well with all firms. The major drawback has been the problem of having responsibility, for instance, to see that a certain number of production units are made but having no line control over the production process. Another drawback is that industry often has used the product manager position as a training position for young managers who tended to have short job tenures.

In considering the position being recommended for the college and university, the conflict problem (responsibility versus authority) must be considered; and consequently, the placement of the job at a top level is being suggested to attempt to resolve it. Also critical is the suggestion that the Director be a mature experienced administrator who is paid a salary commensurate with the potential he can offer the institution. This will add to the prestige and status of the position.

Summary

The purpose of marketing in a commerical organization is to help the company focus outwardly in attempting to better understand its clients. From the pilot study conducted by the author, it appears that many different departments and functions in an institution of higher learning are involved with marketing. As examples, one can point out that counseling is involved with assessing current clients; admissions finds the fit between the school and potential clients; development interprets the activities of the institution to others, etc. But the problem is that each of these often takes place with little coordination with the others. The proposal in this article is to give a top level staff administrator the responsibility to bring related marketing functions together to help the institution to focus better on its constituencies. As one President observed, "We're doing a lot of things, marketing-wise, in different places, but we need to put it all together." A Director of Marketing in higher education can help put it all together for the benefit of the school and society.

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[1] The study was sponsored by HEW's Fund for Improvement of Postsecondary Education. The results are reported in *Understanding the clients of higher education*, June, 1974, 22 pages.

[2] For detailed discussions, see: Fram, E. H. Marketing higher education. In D. W. Vermilye (Ed.), *The future in the making—Current issues in higher education.* San Francisco: Jossey-Bass, 1973, pp. 56-67. Also see: We must market education. *Chronicle of Higher Education*, April 17, 1972, p. 8. *Marketing mismanagement in higher education.* Working paper, Rochester Institute of Technology, October, 1971. Marketing revisited: Clarifying concepts and strategies. *The College Board Review*, Winter 1974-75, pp. 7-9.

AN EXAMINATION OF ABILITY TO PAY AND COLLEGE ATTENDANCE COSTS ACCEPTED BY THE STUDENT AND THE FAMILY

Larry G. Jones, The University of Georgia

Proposed solutions to the financial crises currently facing American colleges and universities most often focus on the role of the student and family in paying for the costs of higher education. Just as it appears certain that the costs of higher education are likely to continue to increase, it appears equally certain that the student and family will be asked to pay more, indeed, quite likely, a larger proportional share of the educational costs.

Recent proposals to increase the student's and family's share of the costs of higher education have been based on a plan to charge students according to their ability to pay, while direct financial aid would be used to assist those students who are unable to meet their share of the costs of college attendance. Ability to pay, it seems, becomes the answer to the question of how much more the student and family will have to pay. Ability to pay has thus emerged as a critical concept in most discussions of financing higher education.

Ability to Pay and College Attendance.

Already a factor in determining the costs of college attendance for many students as a part of student aid need analysis, ability to pay is now systematically determined by analysis of parent and student resources in order to calculate how much a student/family could contribute toward the costs of college attendance (ACT, 1972, p.17). The amount of financial aid needed is then calculated as the difference between ability to pay and the costs of college attendance set by the college. Ability to pay, as determined by need analysis, was defined as Computed Ability to Pay (CAP) for the purposes of this study (Jones, 1975).

Computed Ability to Pay, which was viewed as an external perception of the amount the family could contribute toward college costs, was seen to have an internally determined counterpart, the Estimated Family Contribution (EFC), which for this study was considered as the student's and family's estimate of the amount they *would* pay for higher education, as determined by what the student expected to spend to attend college.

In recognition of the influence of perceptions of economic status on educational plans, it was the purpose of this study to examine the relationship between CAP and the EFC and to examine the relationship of CAP to the costs of college attendance accepted by the student and the family. Although ability to pay, as determined by need analysis, is not an absolute determination of what a student/family must pay, will pay, or does pay for higher education, the relationship of CAP to the EFC and the relationship of CAP to the actual costs accepted by the student and family were viewed as basic to an understanding of college selection and the college attendance costs accepted by the student and the family.

Specifically, four basic questions involving the student's and family's ability to pay and the costs of college attendance faced by the student and the family were examined in this study. The first question dealt with the relationship between the student's and family's CAP and their EFC. In a related examination, the relationship between the computed contributions expected from parents and students and the estimated contributions from parental and student resources toward the costs of college attendance was also examined.

Comparative costs of college attendance among the several colleges the students seriously considered attending were examined in analyzing the second research question, while the relationship between CAP and the costs at the college the student attended was the subject of the third area of investigation.

The final research question examined the difference between underpayers and overpayers, those whose EFC was much less than their CAP and those whose EFC was much greater than their CAP.

Data for the research involved in this study were taken from the data developed for the College Investment Decision Study conducted by McMahon (1974) which included student and family information obtained from the American College Testing Program's ACT Assessment, and a special questionnaire administered in the fall of 1972; family financial information based on the ACT Family Financial Statement; and information on the college the student attended based on data contained in the American Council on Education's Institutional File.

The Relationship Between The Student's and Family's Computed Ability To Pay And The Estimated Contribution

In the first analysis, statistically significant differences were found between the mean CAP and the mean EFC for the total study sample and by family income groups. For students from families with incomes under $10,000, the mean EFC was significantly larger than the mean CAP; the mean CAP of students from families with incomes over $10,000 was significantly larger than their mean EFC.

Clearly, CAP for college, as determined by need analysis, is not a good indicator of what students expect to pay to attend college.

Students from families with incomes under $10,000 reported they expected to pay significantly more for a year of college than their CAP suggest they could pay; students from families with incomes over $10,000 reported they expected to pay significantly less for a year of college than their CAP would suggest they could. The data suggest that students from families with incomes under $10,000 are spending more for college than current standards for determining ability to pay would imply is reasonable. While it can be further concluded that students from families with incomes over $10,000 are paying less than their CAP would suggest they could, the concept of CAP does not include determination of how much a student must or will pay for college. It is intended only to give some indication of how much a student/family could pay in light of family financial circumstances.

The reasonably consistent mean EFC through the family income groups indicates that the average student/family finds it has to pay around $900 for a year of college, and that students who could pay more simply do not find it necessary to do so in order to attend a college suitable to them. Although questions concerning why students spend as much or as little as they do to attend college, or whether they would spend more if it were necessary, were not dealt with in this study; the findings do suggest that conclusions about how much students *will* spend based only on how much they *could* spend should be drawn with caution.

The Relationship Between Computed Parent and Student Contributions and Estimated Parent and Student Contributions Toward College Attendance Costs

As CAP and EFC are composed of parental contributions and student contributions, differences in the computed and estimated contributions from parents and students toward college attendance costs were examined so that the CAP-EFC differences might be better understood.

Differences between what a student/family could spend for college attendance costs (CAP) and what the student/family expects to pay for college (EFC) are primarily differences between the Computed and Estimated Parental Contribution toward college attendance costs.

Comparisons by level of family income between the Computed and Estimated Parental Contributions toward college expenses revealed significant differences, while the comparisons between the Computed and Estimated Student Contributions toward college attendance costs from student resources indicated no significant differences between the two.

The data revealed that students from families with incomes under $7,500 estimated their parental contribution toward college attendance costs to be higher than the CAP, and that students from families with incomes over $10,000 estimated smaller parental contribution than was determined possible by need analysis computations.

As the estimated Student Contribution toward college attendance costs was found to be similar to the Computed Student Contribution and fairly consistent through the family income groups, it was the parents who made up the CAP-EFC differences, or in families with incomes over $10,000, who "saved" when CAP exceeded EFC.

It appears that the parental contribution toward college expenses may be determined by the amount necessary to meet the cost of college attendance after the student's contribution is considered.

The findings suggest that need analysis is closer to reality when it assesses contributions toward college expenses from student resources, and they may well confirm the need analysis assumption that student resources are either directly or indirectly used principally for college expenses.

Figure 1

A SUMMARY OF THE DIFFERENCES BETWEEN COMPUTED ABILITY TO PAY (CAP) AND ESTIMATED FAMILY CONTRIBUTION (EFC) BY FAMILY INCOME GROUP

Family Income Group	No. of Cases	Mean CAP	Mean EFC	Mean Diff.
Under $3000	225	$507	$949	-$442*
$3000 $4999	232	$494	$897	-$403*
$5000 $7499	341	$536	$867	-$331*
$7500 $9999	369	$736	$907	-$171*
$10000 $14999	607	$1348	$917	$431*
$15000 and Over	369	$3086	$940	$2146*
Total Sample	2143	$1232	$913	$319*

*Significant at the .01 level of confidence

Figure 2

A SUMMARY OF THE DIFFERENCES BETWEEN COMPUTED AND ESTIMATED PARENTAL AND STUDENT CONTRIBUTIONS BY FAMILY INCOME GROUP

		MEAN PARENTAL CONTRIBUTION			MEAN STUDENT CONTRIBUTION		
Family Income Group	**No. of Cases**	**Computed**	**Estimated**	**Mean Diff.**	**Computed**	**Estimated**	**Mean Diff.**
Under $3000	225	$94	$503	– $409*	$413	$446	– $33
$3000 $4999	232	$93	$540	– $447*	$401	$357	$44
$5000 $7499	341	$138	$492	– $354*	$397	$375	$22
$7500 $9999	369	$358	$471	– $113	$378	$436	– $58
$10000 $14999	607	$935	$524	$411*	$413	$393	$20
$15000 and Over	369	$2533	$488	$2045*	$553	$452	$101
Total Sample	2143	$805	$503	$302*	$427	$409	$18

*Significant at the .01 level of confidence

Figure 3

A SUMMARY OF THE DIFFERENCES BETWEEN THE COSTS OF COLLEGE ATTENDANCE AT THE COLLEGE ATTENDED AND TWO OTHER COLLEGES CONSIDERED

		MEAN COST OF ATTENDANCE				MEAN COST OF ATTENDANCE		
Cost of College Attendance	**No. of Cases**	**College Attended**	**College A**	**Mean Diff.**	**No. of Cases**	**College Attended**	**College B**	**Mean Diff.**
Estimated Cost of College Attendance	1699	$1823	$2105	– $282*	1297	$1864	$2165	– $301*
Computed Cost after Financial Aid	1699	$589	$1795	– $1206	1297	$637	$1989	– $1352*
Computed Net Student Cost	1699	$1364	$1963	– $599*	1297	$1409	$2086	– $677*

*Significant at the .01 level of confidence

The Relationship Between the Costs of College Attendance at the Colleges Considered by the Student and the Costs of College Attendance at the College the Student Attended.

Cost of college attendance data were available for as many as three colleges for students included in the study, including the college the student actually attended and up to two other colleges the student seriously considered attending.

On the basis of the data reported by the student, it was found that, on the average, the student chose from among those seriously considered the college that was least costly in terms of the base cost (the Estimated Student Cost of College Attendance or ECCA), that was least costly when the base cost was discounted with non-repayable scholarships and grants (Computed Net Student Cost or CNSC), and where the immediate costs of college attendance had been further reduced by a financial aid package that included scholarships, grants, work-study, and loans.

While some of the cost differences among the colleges may reflect the more detailed reporting of financial aid at the college attended or a willingness on the part of the student to accept work-study and/or loans in greater amounts at the college he or she really wanted to attend, it was assumed that the financial aid reported by the student represented the best offer the college thought it could make to the student.

It was not possible from the data available to determine whether the student attended the college because it was least costly or whether the least costly of those considered was the college the student wanted to attend, but only that the college attended was the least costly of those considered. Nor was it possible from the data to determine whether the student had thought about other colleges, but because of cost did not seriously consider attending any of them. Although it would be improper to infer cause and effect from the findings, the findings do suggest that students did, for some reason, enroll in the colleges they found least costly to attend.

The Relationship Between the Student's and Family's Computed Ability to Pay and the Costs of College Attendance at the College the Student Attended

The mean Estimated Cost of College Attendance, (ECCA), the unassisted base cost to the student, was found to be significantly larger than the mean CAP for all students and for students from all families with incomes under $15,000; the differences in CAP and ECCA resulted primarily from differences in CAP through the sample and family income groups. The fact that ECCA was found to be rather uniform throughout the sample and the family income groups may suggest either that there is less price choice in college attendance than is usually assumed or that there is an upper limit to the college costs that most students/families will consider.

It is clear from the data, however, that the unassisted cost of college attendance for most students is significantly

Figure 4

A SUMMARY OF THE DIFFERENCES BETWEEN COMPUTED ABILITY TO PAY (CAP) AND THE COSTS OF COLLEGE ATTENDANCE AT THE COLLEGE THE STUDENT ATTENDED BY FAMILY INCOME GROUP

			Estimated Cost of College Attendance		Computed Cost After Financial Aid		Computed Net Student Cost	
Family Income Group	No. of Cases	Mean CAP	Mean	CAP Diff.	Mean	CAP Diff.	Mean	CAP Diff.
Under $3000	224	$508	$1812	– $1304*	$564	– $56	$1408	– $900*
$3000 $4999	228	$497	$1864	– $1367*	$659	– $162	$1461	– $964*
$5000 $7499	338	$537	$1770	– $1233*	$535	$2	$1295	– $758*
$7500 $9999	362	$734	$1747	– $1013*	$520	$214*	$1269	– $535*
$10000 $14999	601	$1350	$1822	– $472*	$625	$725*	$1381	– $31
$15000 and Over	365	$3077	$1814	$1263*	$618	$2459*	$1383	$1694*
Total Sample	2118	$1232	$1803	– $571*	$589	$643*	$1360	– $128

*Significant at the .01 level of confidence

greater than current methods of need analysis suggest students/families can afford without substantial financial assistance.

Scholarships and grants, which do not have to be repaid and may be considered a discount to the base cost of college attendance, were found to reduce the cost of college attendance an average of $1,360 for all students. The Computed Net Student Cost (CNSC) for students from families with incomes over $15,000 was significantly below their CAP, at about the same level as CAP for students from families with income between $10,000 and $14,999, and significantly higher than the CAP for students from families with incomes below $10,000.

The total Financial Aid Package awarded the student, including loans and work-study as well as scholarships and grants, served to reduce the immediate costs of college attendance to about the same level as CAP for students from families with incomes under $7,500 and to reduce the immediate costs of college attendance to levels significantly below the CAP for students with family incomes over $7,500. In the cases of CNSC and CCFA, the costs resulting from student aid awards were fairly consistent throughout the sample and family income groups, with no apparent relationship between the aid awarded and the amount of need demonstrated by the student, even though the total aid package did appear to meet the immediate needs of the students from families with lower incomes.

There was little evidence, however, that student aid, either in the form of scholarships or grants, or in the total Financial Aid Package was tied to the CAP of the students in the study. The differences which were found to exist between CAP and the several costs of college attendance were more the result of differences in CAP among the family income groups than they were differences in the Estimated Student Cost of College Attendance, Computed Cost After Financial Aid, or Computed Net Student Cost to students from different family income groups.

Differences Between Underpayers and Overpayers

Differences in underpayers, those who reported spending at least $1,500 or less than their CAP to attend college, and overpayers, those who reported to be spending $1,500 or more over their CAP to attend college, were examined for the purpose of gaining additional insight into the college costs, college attendance, student/family affluence relationships. Selected variables from the CIDS data file representing financial characteristics, characteristics of the colleges attended, and student and family characteristics were used in statistical comparisons of the underpayers and overpayers.

In the comparison of underpayers and overpayers, significant differences were found to exist between underpayers and overpayers in student characteristics, family characteristics, student and family financial characteristics, and in the characteristics of the college attended. Underpayers who were found to have more impressive financial characteristics were receiving more student financial aid, in addition to living at home and attending less costly colleges, all factors, which combined, keep their costs of college attendance below their CAP. Overpayers, on the other hand, who were from less affluent families, and often broken homes, were receiving less student aid to attend more selective and more expensive institutions.

Although it was expected that underpayers and overpayers would differ in the areas of family finances and the costs of college attendance, other differences discovered, specifically in the student and college characteristics, run counter to expectations and to currently held ideas about who goes where to college. Also, the findings dealing with the financial aid to overpayers and underpayers are inconsistent with the current philosophy of student aid on the basis of need.

Implications For Financing Higher Education and for Student Financial Aid Policies and Practices

On the basis of the findings of this study, the proposals to increase student tuition and fees as a means of providing additional funding for higher education would have to be questioned. At the root of such proposals is the notion that students and families who are able to pay more of the costs of higher education do so. Data in this study, however, indicate that only the students from families with incomes over $25,000 have CAP in excess of the basic costs of college attendance, and they represent a minority of the students in the study and in the census data. For the students from families with incomes less than $15,000, the majority of students, the ECCA is significantly greater than CAP at present college costs.

Although it could be claimed that the findings suggest that CAP is calculated too low, at least on the basis of the EFC toward the costs of higher education, the fairly uniform EFC and costs of college attendance identified in the study may more correctly represent what the "going cost" is to attend college. If that be true, then all but the upper income families, the minority with the higher ability to pay, would have to make additional sacrifices or concessions as the costs of college attendance increase. Also, of course, it is not at all clear that those who could pay more would pay more to attend college, since students from all family incomes and CAPs were found to be attending the least costly of the institutions they seriously considered attending, an indication that some colleges may have priced themselves out of the market already and that even the affluent may be cost conscious when it comes to higher education.

Direct student aid, which is usually a part of proposals to increase student tuition and fees as the means by which financial assistance is provided to students who are unable to pay the higher costs, was found to reduce the costs of college attendance to the CAP level for students from lower family incomes in this study. Student aid, however, was also found to reduce the costs of college attendance for students from higher family incomes to levels significantly below their CAP, which may well be an inefficient use of student aid funds.

Whether or not financial aid inducement was necessary to attract students with CAP into higher education is unknown. However, if the financial aid was a necessary inducement to the more affluent student, a sizable portion of any student tuition and fee increase would have to be plowed back into financial aid for all students, not just the needy, and the goal of having students pay according to their ability to do so would still be only a goal. Rather than increase tuition and fees to all students and then give them all more aid, it might be as practical to leave tuition and fees alone and divert the financial aid money given to those who do not need it back to the general fund.

The findings of this study would indicate that the concept of Ability to Pay as a basis for determining student costs should be made a working principle in financial aid before it becomes a financing priority.

Although student aid based on financial need is supposedly a working principle in student financial aid practice, there was little evidence in this study to support that as fact. The findings of this study are even more surprising in view of the fact that the students included in the study had to have completed Family Financial Statements which would have been available to the financial aid officer. Although there is no commitment on the part of the college to follow the need analysis findings in making financial aid awards, one presumes that need analysis is more than just a formality in the student aid process.

The cost competition implicit in the findings may be a cause or a result of the financial aid policies practiced by the colleges. In either case, the evidence which indicates that students attended the least costly college of those they considered attending has obvious implications for financing higher education and serious implications for students aid practice.

Cost competition at the basic cost level (ECCA) did not appear to be so severe and perhaps is not so serious in view of the established cost differences between public and private institutions. Some would say that different costs for different institutions are, in fact, a healthy thing. The more insidious cost competition stems from the use of financial aid as in inducement or recruiting device to attract students rather than as a means to provide assistance to those who need aid to attend. The significant differences between colleges in the Computed Cost After Financial Aid (CCFA) and the CAP-CCFA differences for students from upper income families suggest that student aid may have been used as a means of attracting students.

If the data do suggest evidence that students are being bought with financial aid, this practice is a serious misuse of financial aid and college resources and should be corrected. One of the purposes of the development of need analysis and the determination of ability to pay was to eliminate financial aid competition and the resulting inefficient use of institutional funds (Moon, 1959, p. 342) and this remains an equally worthy goal in today's student market and institutional financing crisis (Winkler, 1974, p.3).

The fact that EFC for students from families with incomes under $10,000 exceeded CAP may indicate that CAP was too low if the EFC represented what the student actually *could* pay for college. If, on the other hand, EFC represented what the student *had* to pay to attend college, then the college cost and financial aid figures would be too low. For students from families with incomes over $10,000, CAP was significantly larger than EFC, which may indicate that the student *would not* pay more than EFC or that the student did not *have* to pay more than EFC. Which of the several possible meanings EFC has in specific cases has important implications for student aid and college financing practices.

Conclusion

As the expectation that the student and/or the family will pay a greater share of the cost of postsecondary education becomes more prevalent, it is increasingly important to understand how much money the family is able and willing to pay for higher education. If the student's and/or the family's ability to pay is not an important factor in a student's decision to attend college, or a particular college, then considerable money that could be utilized elsewhere in higher education is being wasted on student aid or lost through low tuition (West, 1963, p. 93). If the student's and/or the family's ability to pay is influential in college attendance, then more should be known about judgments and perceptions concerning ability to pay. As they seek relief from their financial crises through increased cost to students, colleges and universities cannot ignore the student and family's ability and willingness to pay.

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LET US END THE TUITION DEBATE

Robert Winter, University of Illinois, Champaign

For the last five years, one of the major issues confronting higher education has been the level of tuition charged at public institutions. Economists, sociologists, legislators, students, administrators of public and private institutions of higher education, commissions, professional societies, and political parties have all taken positions on this issue. Unfortunately, the length and intensity of the debate has not provided any clear guidelines on what tuition levels should be. Every year the same arguments are repeated, and yet tuition levels change for reasons which are not well understood.

The debate reached its peak during 1973 when the Carnegie Commission on Higher Education and the Committee for Economic Development (CED) independently recommended significant tuition increases. The Carnegie Commission (1973) recommended that tuition levels at public institutions should remain "relatively" low for the first two years of higher education, but that tuition charges for upper division and graduate levels should eventually reach a level equal to one-third of educational costs. The underlying objectives for these recommendations were:

1. Maintain low tuition charges for the lower division to encourage access,
2. Allocate increased resources obtained from higher tuition charges to financial aid programs to offset the impact of higher costs on low-income students,
3. Reduce the tuition gap between public and private institutions, and
4. Preserve the "mixed system" of financing higher education in which costs are borne by students, parents, taxpayers, and philanthropists.

Some negative reactions to the recommendations prompted the Commission to release in April 1974 a statement clarifying the impact and intent of the recommendations (Boffey, 1974). This statement recognized some "major errors" in estimating current tuition levels and de-emphasized the objective to reduce the tuition gap between public and private institutions. The Commission indicated that direct state support should be made available to private institutions, therefore eliminating the need for sharp increases in their tuition charges.

The recommendations of the CED, released in October of 1973, centered around the financial difficulties faced by colleges and universities. Six alternative steps were listed: "(1) increased income through higher tuition, (2) increased support from government, (3) larger gift income, (4) greater overall efficiency in the use of resources, (5) reduction in programs, or (6) some combination of these" (Committee for Economic Development, 1973). The CED recommended that tuition charges be increased until they reach approximately 50% of instructional costs within the next 5 years.

The recommendations to increase tuitions were countered by reports prepared by the Association of American Colleges (AAC), the Association of American Universities (AAU), and the National Association of State Universities and Land-Grant Colleges (NASULGC). These proponents for low tuition levels argued that higher levels would be contrary to American traditions for low cost education. The impact on access was a major concern expressed in these reports.

The debate on the level of tuitions continues. Virtually every issue of *The Chronicle of Higher Education* reports on another proponent or opponent of high tuition levels. The tuition debate is an abstract one at best, and is one which mixes emotion and theory. The remaining part of this paper will document the lack of impact of the Commission's and CED's recommendations to increase tuitions and will attempt to describe the actors and the forces which actually affect the establishment of tuition policy.

Impact of the Recommendations to Increase Tuition Charges

The pressure to increase tuition charges has been very evident for the past five years. As a result of numerous factors, including student demonstrations, competing public services, and inflation, public institutions of higher education have been faced with limited resources. Tuition income has been considered a revenue source which can complement tax revenues and, as Tables 1 and 2 demonstrate, tuition charges have been increasing steadily every year.

However, the fact that tuition charges have increased does not necessarily support a philosophy of high tuition nor a move to the one-third to one-half instructional cost recommendations. An analysis of Tables 1 and 2 shows that no significant change has taken place as a result of the Carnegie Commission's or the CED's recommendation. For State and Land-Grant Universities, the percent change in 1974-75 is significantly smaller than in four of the previous five years.

Table 1

CHANGES IN ANNUAL TUITION AND FEES*
1970-71 Through 1974-75
Four-Year Public Institutions

	Tuition and Fees	Percent Change
1970-71	$395	—
1971-72	439	11.14%
1972-73	465	5.92
1973-74	498	7.10
1974-75	551	8.60

*SOURCE: *The Chronicle of Higher Education,* Volume VIII, No. 25, March 25, 1974, p. 10.

Table 2

TREND IN CHARGES FOR ANNUAL TUITION AND FEES*

STATE AND LAND-GRANT UNIVERSITIES

Year	Amount	Percent Increase
1965-66	$331.00	—
1966-67	333.00	7.07%
1967-68	351.00	5.56
1968-69	360.00	2.42
1969-70	430.00	19.44
1970-71	452.00	5.23
1971-72	482.00	6.52
1972-73	517.00	7.37
1973-74	520.00	.48
1974-75	531.00	2.11

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*SOURCE: National Association of State Universities and Land-Grant Colleges, September 1, 1974.

If the trends in changes in tuition charges do not represent a philosophical agreement on high tuition, then it is necessary to analyze the process under which such decisions are made. Such an analysis will be performed in the next section using the State of Illinois as a test case.

The Decision Process to Establish Tuition Levels - The Illinois Case

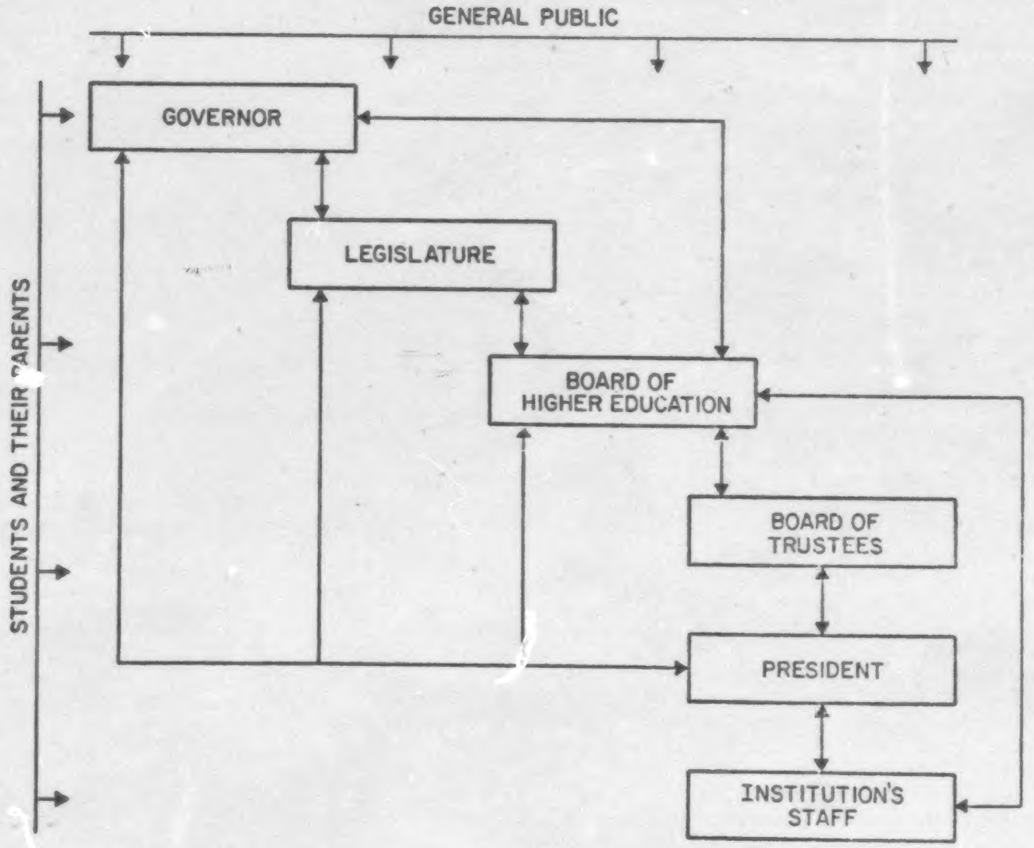
A. The Actors

To describe the process under which decisions are made on public tuition charges, the actors affecting the process must be identified:

1. General Public - Role: TAXPAYER - The general public through the power of the vote can affect tuition policy. This group, already overburdened by state and federal taxes, may actively participate to support an increase in tuition or user charges to reduce the demands on tax revenues.
2. Government - Role: POLITICAL - Faced with com-

Figure 1

POLITICAL FLOW


GENERAL PUBLIC
GOVERNOR
LEGISLATURE
BOARD OF HIGHER EDUCATION
BOARD OF TRUSTEES
PRESIDENT
INSTITUTION'S STAFF
STUDENTS AND THEIR PARENTS

peting public services, limited sources of funds, and a great risk whenever taxes are increased, the legislative and executive branches determine the share of higher education costs to be obtained from general taxes and the share to be obtained from tuition income.

3. Students and Their Parents - Role: CONSUMER - As consumers, students and their parents advocate the continuation of low tuition charges.
4. Administrators of Public Institutions of Higher Education - Role: CORPORATE - College and university administrators determine and describe the financial needs of their institutions and work to obtain sufficient resources to meet their objectives. Faced with limited general tax resources, administrators logically may seek increases in other sources of income, such as tuition income.
5. Coordinating Boards - Role: ARBITRATOR - Such boards find themselves in the middle of the decision process because they attempt to represent both state government and higher education. They recognize both the limitations in state resources and the needs of higher education.

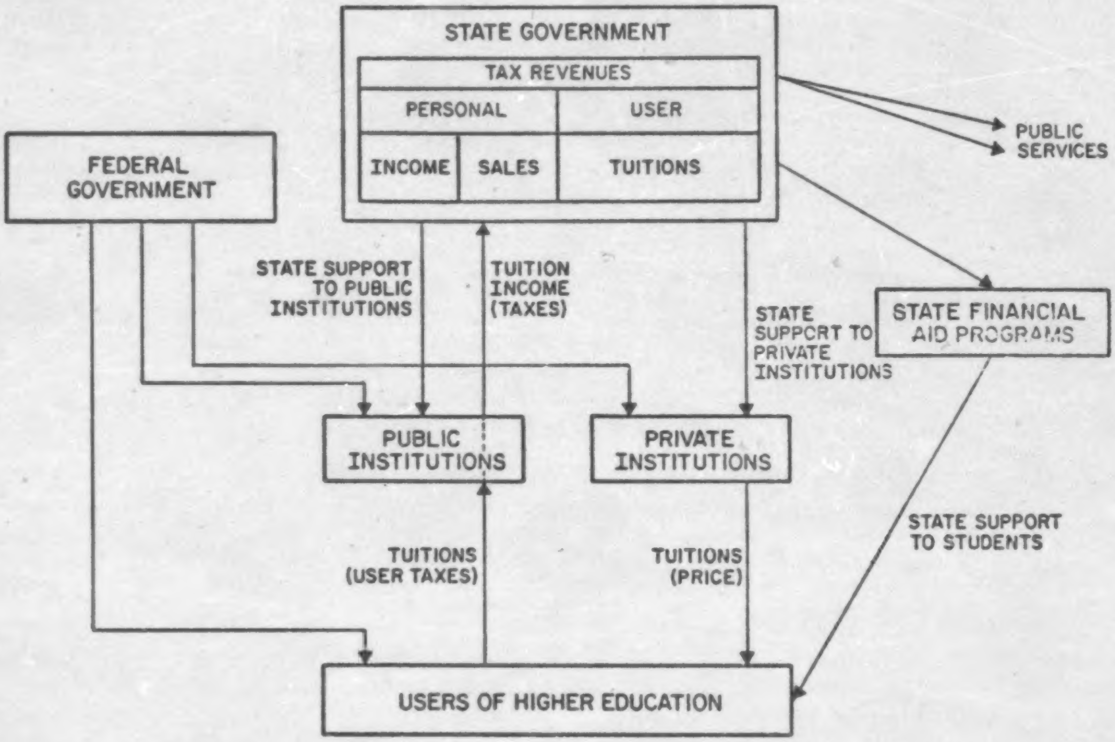
The interaction between the actors is described in Figure 1, The Political Flow, and Figure 2, The Flow of Resources.

These actors represent their own interests in the decision process. Each is exposed to the academic rationale proposed to support high or low tuition, and yet, they do not appear to be affected by the various arguments as each makes its own recommendations on the level of tuition charges.

An understanding of the decision process can be obtained by describing the process experienced in the fiscal year 1973-74 affecting public tuition levels in Illinois for fiscal year 1974-75.

Figure 2

FLOW OF RESOURCES


STATE GOVERNMENT
TAX REVENUES
PERSONAL
USER
INCOME
SALES
TUITIONS
PUBLIC SERVICES
FEDERAL GOVERNMENT
STATE SUPPORT TO PUBLIC INSTITUTIONS
TUITION INCOME (TAXES)
STATE SUPPORT TO PRIVATE INSTITUTIONS
STATE FINANCIAL AID PROGRAMS
PUBLIC INSTITUTIONS
PRIVATE INSTITUTIONS
STATE SUPPORT TO STUDENTS
TUITIONS (USER TAXES)
TUITIONS (PRICE)
USERS OF HIGHER EDUCATION

SOURCE: Winter, *An analysis of the effects of tuition and financial aid policies in tomorrow's imperatives today.* The Association of Institutional Research, 1973, p. 176.

Table 3
TUITION CHANGES FOR THE UNIVERSITY OF ILLINOIS

	Annual Tuition	Percent Change	Percent of Instructional Costs
1969-70	$246	—	12.13%
1970-71	321	30.29%	15.44
1971-72	396	23.36	19.35
1972-73	496	25.25	24.06
1973-74	496	—	21.22

B. The Illinois Scenario

1. In December 1970 the State of Illinois Board of Higher Education (BHE) approved the concept of establishing tuition charges for public institutions at one-third of undergraduate instructional costs. This decision led to the increases for the University of Illinois listed on Table 3.
2. In his budget statement on March 1973, Governor Walker reaffirmed his position to not increase any taxes in the State of Illinois.
3. In the fall of 1973 the public institutions of higher education in Illinois were facing the third consecutive year of limited resources. The future did not look promising.
4. The Board of Higher Education had formed a Tuition Task Force and it was expected that the one-third of instructional costs concept would be reaffirmed, leading to an increase in tuition for fiscal year 1974-75.
5. On November 14, 1973 President John E. Corbally, Jr. of the University of Illinois recommended to the Board of Trustees that:

   "If deemed necessary in the light of recommendations of the Board of Higher Education concerning the 1974-75 budget levels and concerning 1974-75 tuition levels, the Board of Trustees of the University of Illinois expresses its intention to support the financial needs of the University by adopting tuition levels up to those tuition levels outlined above (a $90 or 18 percent increase)." (Tuition Policy and Tuition for 1974-75)

   This recommendation was made recognizing that "there is no real support in theory or in philosophy for" the BHE position that tuition should approximate one-third of undergraduate instructional costs. The major rationale for the recommendation was that "the resources available to the University are not keeping pace with the costs of inflation" and that "increases in state tax support of higher education will not, in and of themselves, keep pace with the increased need for resources." (See Table 4, State Resources Allocated to Higher Education.)
6. In January 1974 the BHE recommended a 6% increase in the tuition charged in public institutions. The Board of Trustees of the University of Illinois recommended in February a 12% increase. Southern Illinois University proposed a reduction of tuition charges to respond to a significant decline (over 25%) in enrollment in the past few years.
7. The decision to increase tuitions resulted in statements of opposition by students and their parents. At the University of Illinois, the Undergraduate Student Association prepared a report describing the impact of increased tuitions on students from middle income families. The Association of Illinois Student Governments, a lobbying organization, expressed its opposition to the Governor and key legislators. All these efforts did not appear to be sufficiently effective to stop the momentum toward higher tuitions.

C. The Final Decision

Given this scenario, it was apparent that, after two years, tuitions were going to increase, but tuition charges were not changed for fiscal year 1974-75 because Governor Walker indicated that, consistent with his policy to not raise taxes, tuitions would remain at 1973-74 levels and the expected increase in income would be replaced with general tax funds.

According to political analysts, taxes were a major issue in the 1974 election for Governor in the State of Illinois. Although most political analysts felt that the State had been well-managed during the administration of Governor Ogilvie, the fact that he had implemented a personal income tax ap-

Table 4
STATE RESOURCES ALLOCATED TO HIGHER EDUCATION IN THE STATE OF ILLINOIS*

		Allocations to Higher Education			
Fiscal Year	Total State General Tax Revenues	Operations and Grants (A)	Scholarship Program (ISSC) (B)	Retirement (C)	Percent Allocated to (A)
1970-71	$2,552,130,100	$394,175,000	$35,539,000	$21,309,800	15.44%
1971-72	2,769,300,900	392,320,600	42,170,000	14,665,500	14.17%
1972-73	3,153,592,400	415,617,500	59,955,100	17,777,000	13.18%
1973-74	3,567,000,000	460,825,100	65,099,500	19,882,100	12.95%
1974-75	3,854,000,000	489,212,300	72,485,000	24,660,400	12.69%

[1] General tax revenues include personal income taxes, sales taxes, and user taxes.

*SOURCES: FY71 to FY73—Annual Reports prepared by the Department of Finance.
FY74 and FY75—Illinois Appropriations prepared by the State's Comptroller.

peared to have been a major cause for the election of Governor Walker who stated during his campaign his opposition to increases in any and all taxes.

Governor Walker's decision to oppose tuition increases and replace the expected increase in income with general tax funds was consistent with the mandate given to him, and pleased all the actors affected by the decision. Students and their parents did not face higher costs, the Legislature was not faced with a difficult decision, college and university administrators were successful in obtaining needed resources, and the Board of Higher Education was able to match state resources and higher education needs.

An analysis of the events leading to the decision to establish tuition levels for 1974-75 reveals that each of the actors had an opportunity to affect the decision process and that each based its position on its own interests.

The Future of the Tuition Debate

The previous analysis indicates that, at best, the arguments presented by the negie Commission, CED, AAC, AAU, and NASULGC are umbrellas under which various interest groups attempt to justify their positions. The debate about public tuition levels centers about the interaction of governmental branches and administrators of public colleges and universities with coordinating boards acting as "middlemen."

Given the limited impact of various rationales which support high or low tuitions, an effort must be made to define the process by which tuition levels are established which is most beneficial to public institutions of higher education. The description of such a process requires a definition of the role of tuition charges: tuitions at public institutions have been erroneously treated as the *price* of purchasing education resulting in attempts to relate the price to the cost of education; tuitions are, in fact, a form of user taxes and public institutions of higher education act basically as agents for the state as *tax collectors*.

Currently, three models for the establishment of tuition charges and for income control can be identified:

1. Tuition levels are established by public institutions of higher education; tuition income is deposited in the state treasury and is appropriated to the institutions. This is the case in Illinois.
2. The institutions establish tuition levels and control the income. This is the case in Ohio.
3. Tuition levels are established at the state legislative and executive level and income is appropriated to the institutions. This is the case for colleges in California.

The first alternative provides most disadvantages since the institution can be placed in the position of being a proponent for higher tuitions, and because tuition income is appropriated by object-of-expenditure categories which limit budget flexibility.

The second alternative has the advantage that no object-of-expenditure restrictions exists. One misleading characteristic of this alternative is that, since the institution has authority to levy and control tuition income, it may raise or lower tuition charges according to the resources received from general taxes, but since both the legislative and the executive branches of government can very easily estimate the potential income derived from tuition, they would probably appropriate general taxes on the basis of total institutional needs.

The third alternative places the tuition decision in the hands of the agencies that determine all levels of taxation. The legislative and executive branches of government evaluate the needs for all state public services and determine the availability of all resources.

Each of the alternatives has some limitations from the point of view of public institutions of higher education: they can depict these institutions as proponents of high tuition levels and they can limit budget flexibility.

The *author believes that the third alternative is the most beneficial for public institutions of higher education,* because it places the decision on tuition levels where all matters of public policy and taxation should be resolved—at the governmental level. This alternative permits college and university administrators to remove themselves from the tuition debate and to devote their efforts to the identification of the objectives of their institutions and of the resources required to achieve them. Having ended the tuition debate, emphasis will be placed on the major concern expressed by current debaters: *access.*

Fears that financial aid programs will not be supported at appropriate levels do not appear well-founded since state governments increased their contributions in fiscal year 1974-75 by more than 25% over the year 1973-74 (Winkler, 1974).The best guarantee for appropriate support to financial aid programs is to end the tuition debate and all actors who participated in that debate concentrate their common efforts and judgments on access. Such judgments may consider an analysis of personal and social benefits on the basic argument that all qualified citizens are entitled to a college education with the absence of financial barriers.

Conclusion

During the past five years, the debate on the level of public tuitions has been very intense, reaching its peak during 1973. An analysis of the process to establish public tuition levels demonstrates that the debate has had no significant impact. This process involves the general public, state government, students and their parents, college and university administrators, and coordinating boards; each of these actors attempts to affect the decision process by representing their own points of view.

Since tuition policy is not established on the basis of economic or social rationale, it is recommended that the decision on the level of public tuitions be placed in the legislative and executive branches of government, where all matters of taxation are resolved.

The end of the tuition debate will result in a shift toward the issues which really concern the current participators in the debate: the needs of higher education and access.

Boffey, P. M. Carnegie clarifies its stand on public-college tuition. *The Chronicle of Higher Education*, April 1, 1974 (VIII), p. 1.

The Carnegie Commission on Higher Education. *Higher education: Who pays? Who benefits? Who should pay?* A report and recommendation by The Carnegie Commission on Higher Education. Hightstown, N.J.: McGraw-Hill, 1973.

Committee for Economic Development, Research and Policy Committee. *The management and financing of colleges.* New York: CED, October, 1973.

Tuition policy and tuition for 1974-75. Memorandum to the Board of Trustees of the University of Illinois from John E. Corbally, Jr., President, November 14, 1973.

Winkler, K. J. States raise aid to students twenty-five percent. *The Chronicle of Higher Education,* November 18, 1974 (IX).

MEASURING STUDENT SUCCESS

Klaus Strigl and Roland Traunmueller,
Johannes-Kepler University, Linz, Austria

The OECD project "Measuring Student Success" has the following four objectives: (a) the development of a new methodology; (b) a detailed analysis of selected studies as an example; (c) the transferability of methods and results on an international level; and (d) first steps toward an institutionalized system for all of Austria.

The Project was carried out by the Austrian Federal Ministry of Science and Research and was supported by a substantial donation of Shell Austria. The first phase of the project was completed at the end of 1974 and the results were submitted to the second General Conference of OECD-CERI-IMHE. The report on the investigation and the various contributions have been published (Otruba, 1975; Sauer, 1975; Steinbacher & Hoellinger, 1975; Strigl & Traunmueller, 1975) and may be obtained from the OECD and the authors.

Models and Methods

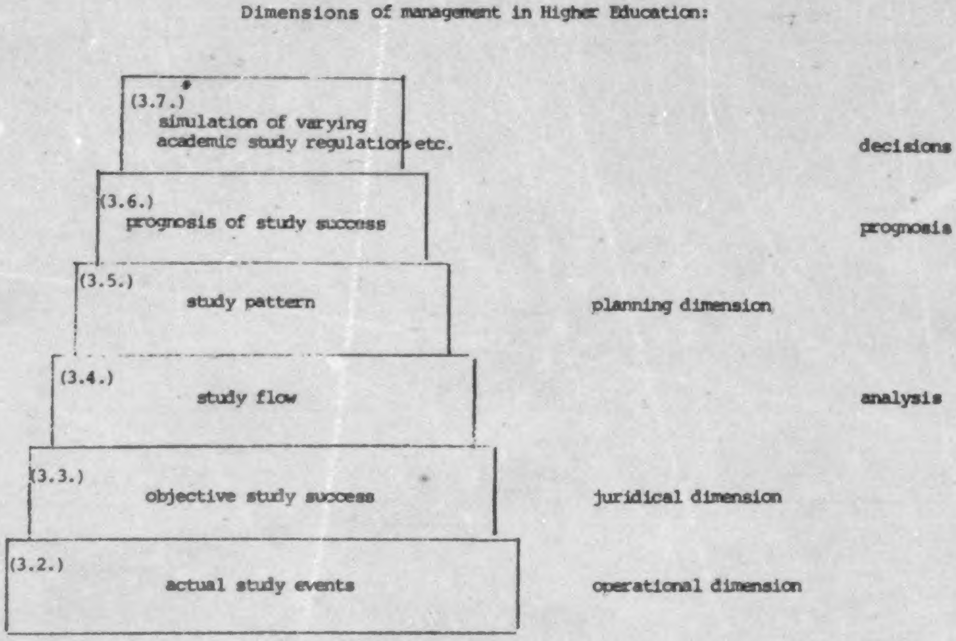
The aim of the system is to obtain *planning data* from operational administrative data (grades, registrations, courses, study rules) (Figure 1). They should mainly serve as indicators which reflect the academic success in its relation to students, rules, and institutions.

It is essential that the method can be applied *continuously*, from which the following problems arise:

1. Only such data may be used that are stored as part of the operational administrative processes.
2. Because of the long durations of the sections of studies (at least 2-3 years), an investigation into the examinations terminating the sections of studies (diploma examinations) alone is of relatively little relevance. Although special attention has been

Figure 1

THE HIERARCHY OF MODELS


Dimensions of management in Higher Education:
(3.7.)* simulation of varying academic study regulations etc.
(3.6.) prognosis of study success
(3.5.) study pattern
(3.4.) study flow
(3.3.) objective study success
(3.2.) actual study events
decisions
prognosis
planning dimension
analysis
juridical dimension
operational dimension

*in ( ) the corresponding sections of the detailed OECD-Report focused on them, it is much more important for the continuous measurement of the study patterns to analyze the study events during a section of studies.

3. There is a feedback of the student from the various administrative acts to the system (registration of a semester, registration of courses, examinations on courses). The degree to which these administratively ascertainable "signs of life" relate to the student's respective position during his studies is varying.
4. The academic study regulations determine the position of one event in the course of studies.

From among the functions listed the *taking of examinations* is the only achievement criterion, being most important. All the other functions (feedback to a certain semester, registration of a course) are important only if regulations or usage create a close relationship with the taking of examinations. In many European training programmes this does not apply.

Also, the position within the training programme of a course successfully passed cannot be determined in many study programmes offered at European, and particularly at German-speaking, universities. The freedom of teaching and learning has led to many *possibilities of choice*. They range from the academic study regulations providing for a great number of subareas, alternative subjects and exchange possibilities, to the concrete course-offer of the university, which provides for the objective norms of the academic study regulations for a number of courses, so that these requirements can be met.

Thus, the student has many possibilities and has even more because of the fact that at German-speaking universities—unlike other university systems—there are only few limitations concerning the sequence of courses. Only in rare cases is a hierarchical sequence obligatory through the system of "personal application." Furthermore, a student may use an academic success (e.g., a seminar which he passed in Operations Research) to meet various requirements of the academic study regulations. The position of the examination taken depends mainly on the context of the other examinations taken as well as on the specific choice of the student (alternative subjects).

Different study flows, etc., can only be compared if the actual academic success is transformed into *objective academic success*. Figure 2 shows the respective basic schema. This schema becomes much more complex if the different possibilities of complying with one single provision of the study rules are taken into account. Figure 3 shows some of these possibilities: (a) *OR*-combinations on the various hierarchical levels of the study rules; (b) equivalences in the course-offer; (c) date, sequence of examinations, and possibility of repeating them at the candidate's choice.

Figure 2
THE BASIC SCHEMA

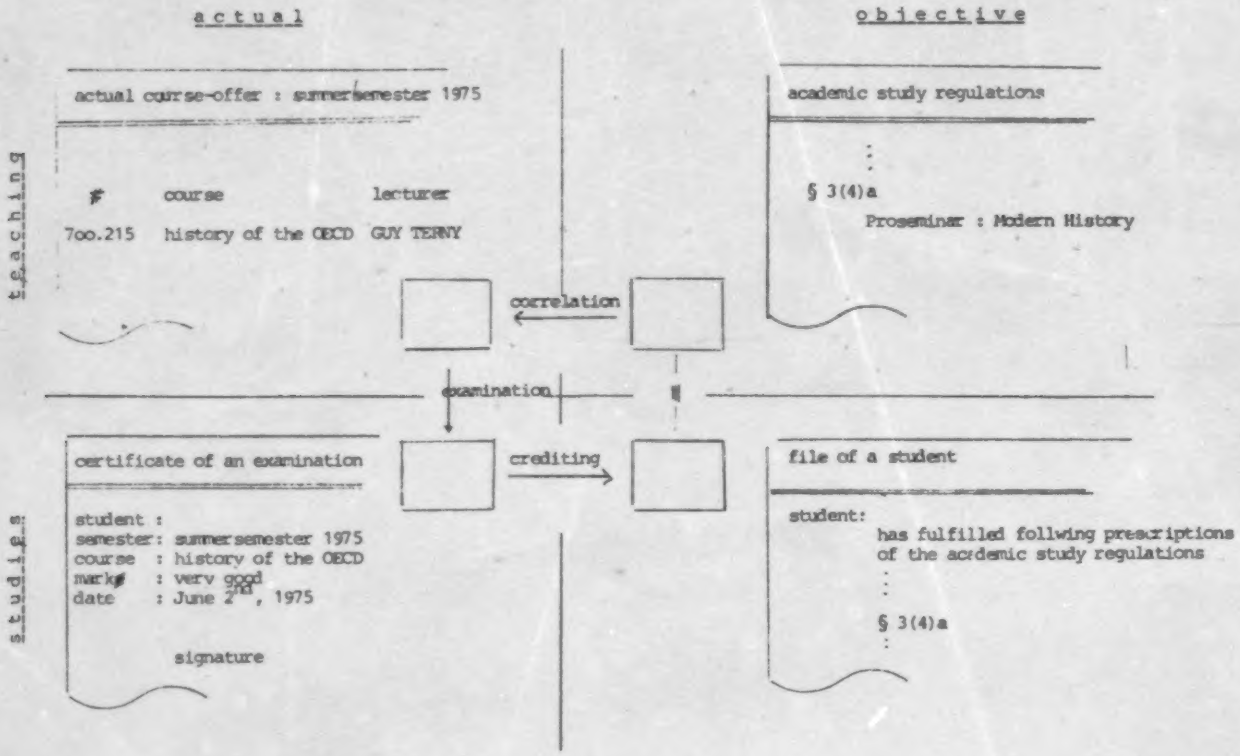

actual
objective
actual course-offer : summersemester 1975
# course lecturer
7oo.215 history of the OECD GUY TERRY
teaching
academic study regulations
§ 3(4)a
Proseminar : Modern History
correlation
examination
crediting
certificate of an examination
student :
semester: summersemester 1975
course : history of the OECD
marks : very good
date : June 2nd, 1975
signature
studies
file of a student
student:
has fulfilled follwing prescriptions of the acrdemic study regulations
§ 3(4)a

Figure 3 also shows the context sensitivity of the crediting algorithm. Further problems which have to be solved are: (a) the representation and coding of the academic study regulations; (b) the "long-term course-offer" as a planning variable; and (c) application and admission as operational bottlenecks of the relation "examination."

The model of the objective academic success forms the basis of the models of the *planning dimension* (Figure 1): model of the objective study flow (discriminatory statistical methods); model of the objective study pattern (classifying statistical methods); model of the expected academic success (prognosis model); simulation of changes in the academic study regulations and in the course-offer and their effects on the academic success.

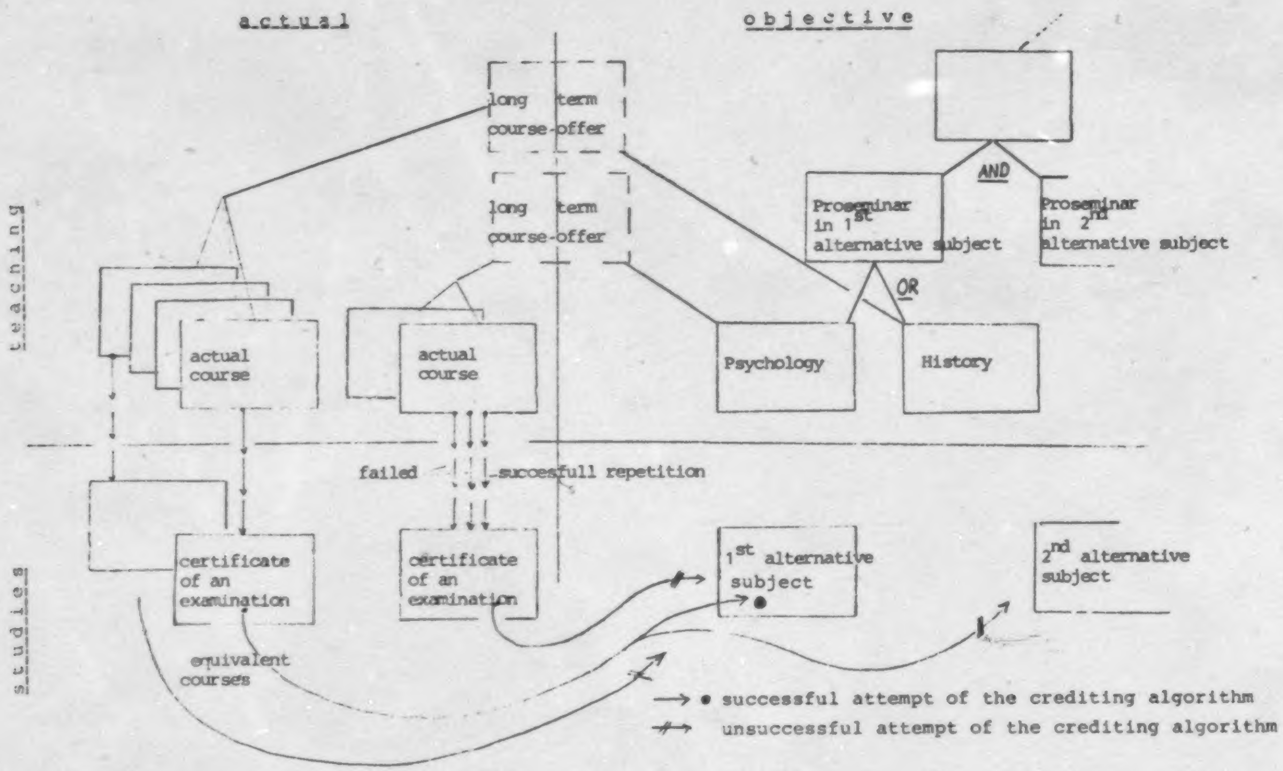
In order to avoid repetitions and save space in this summary, the models and methods are discussed in connection with the concrete examples contained in the following section. In many prognosis and capacity models study rules are implicitly taken into account in the form of transition quotas, course-load matrices, etc. (Schrammel & Griese, 1971; Dettweiler & Frey, 1972; Hussain, 1973). In all those cases where such general analysis becomes too approximate or if the global values established for these quota are uncertain and disputed, it may be indicated to fall back on the present detailed model.

Results and Interpretations

The first investigation concentrated on the study programme Business Administration (609 students who began their studies in the years 1966-1968); in addition, some analyses were carried out into the study programmes Sociology and Informatics which, however, posed difficulties of a statistical nature because of much smaller student figures (one-fifth). The drop-out rate observed (discontinuation and unsuccessful studies for an excessive period of time) is fairly high: for the first section of studies (2 years) 50%; for the entire course of studies (4 years) two-thirds. It was striking that students dropped out mainly at the beginning of their studies and that only a few examination results (positive as well as negative ones) were available. We may draw the conclusion that the beginning of studies as well as the adaptation period to the university play an important role.

Four *groups of study flow* were defined: (a) successful students, who complete their studies within the normal duration of studies; (b) "retarders", who require more than the normal duration of studies for successfully completing their studies; (c) drop-outs, who discontinue their studies; and (d) unsuccessful students, who stay at the university far beyond the normal duration of studies without completing even part of their studies. The normal duration of studies is determined by

Figure 3
THE CONTEXT SENSITIVENESS OF THE OBJECTIVE STUDY SUCCESS


actual
objective
teaching
studies
long term course-offer
long term course-offer
actual course
actual course
AND
Proseminar in 1st alternative subject
Proseminar in 2nd alternative subject
OR
Psychology
History
failed
succesfull repetition
certificate of an examination
certificate of an examination
1st alternative subject
2nd alternative subject
equivalent courses
→ ● successful attempt of the crediting algorithm
↛ unsuccessful attempt of the crediting algorithm

distribution criteria and were equated for the study programme Business Administration with the duration of studies as prescribed by law.

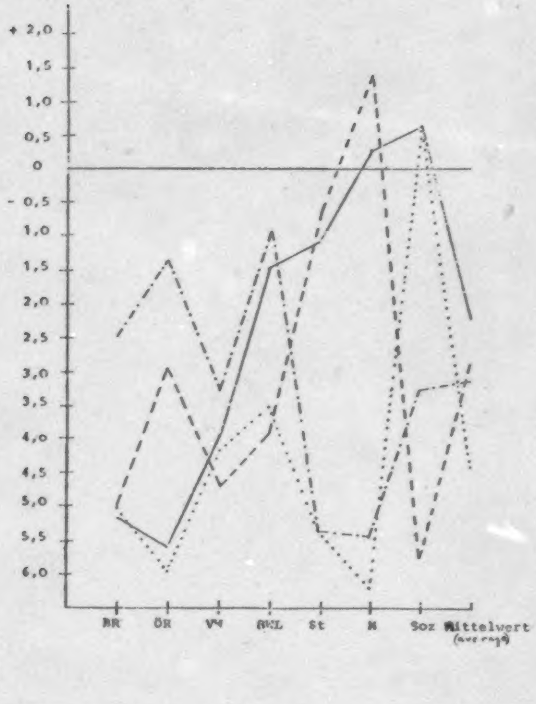
These four groups significantly differ from each other with respect to all essential variables of academic success such as grades in exercises, number of examinations taken, examination date, etc. It was also possible to differentiate them by means of the discriminatory analysis. A factor analysis of all these variables yielded only one factor, "academic success."

The *study pattern* was further differentiated by means of the cluster analysis (Reichl & Weinzinger), whereby grades and dates when certificates in exercises of the first section of studies were obtained were included as variables. The analysis yielded clusters which largely correspond with each other as concerns their ranks according to grades and examination semesters. This means that students who study fast are, at the same time, those who obtain good grades in the examinations, which corresponds well with one single factor as a result of the factor analysis.

A typical example for behavioural patterns revealed by the cluster analysis is shown in Figure 4. The highly differentiated success and difficulties may be interpreted in the following way: There are groups of students with more verbal talents and such with more formal-abstractive talents. The first group has difficulties with the mathematical-statistical subjects, the second one with the legal subjects. Another possibility of interpretation would be that examinations have a typical *barrier function*, since students with otherwise normal academic success fail in one single examination (usually legal subjects). Here, institutional influences might effect the study flow, as was proved in an analysis of the grading patterns of examiners. The cluster analysis of the study pattern and behaviour further suggests that successful students rationally plan their studies, whereas unsuccessful students very easily engage in uncoordinated attempts.

Figure 4

STUDY PATTERNS OBTAINED BY CLUSTER ANALYSIS



Cluster Analysis; examination semesters of the first section of studies (deviation from mean value) for different certificates. Only cluster with low ranks are included.

BR	civil law	St	statistic
ÖR	public law	M	mathematics
VW	Economics	Soz	sociology
BWL	Business administration		

For the *prognosis* of the academic success two models were developed: (a) a cluster model, based on the n-dimensional distances from the centre-points of the groups; and (b) a friction model, which is very similar to physical friction equations. The exactness of the prognosis for the first section of studies was 63% (successful students, retarders, unsuccessful students) and 84% (success/dropping out). It was surprising that this percentage can be achieved with the grades of the first six months of studies. The prognosis values were based on explanatory models with a relatively simple structure; by empirically using further parameters according to the "trial and error" procedure, the percentages may even be improved; in such case, however, the explanatory value of the model is reduced.

It seems remarkable that a prognosis can be made at such an early date. It may be used as an individual prognosis that helps to improve the aid extended to the student within the existing psychological counselling services. As a collective prognosis, it may allow for a rapid supervision of the success of university policy measures. Assuming that it is the small feedback of the system to the individual that effects high drop-out rates as well as delays in studies, such a feedback of success in an information system might become highly important for the students.

Based on the findings of the investigation, we attempted to prepare a global theoretical model of the study flow, starting from the fact that personality factors, interaction factors, and institutional factors mutually determine the study flow. With these concepts the following hypotheses may be formulated (see also Fig. 5).

(H1) Social factors prevent access to the university for a great number of potential candidates.
(H2) Social and mental factors control the decision of whether or not to study and the choice as to the study programme or university town.
(H3) The extent of the student's adaptation to his studies during the first few semesters basically determines whether or not the studies can be completed. Lack of adaptation leads to dropping out.
(H4) Primarily mental and interaction factors determine the adaptation in the second place institutional and social factors.
(H5) If the students manage to adapt, personality characteristics and interaction factors determine the individual speed of studying.
(H6) The average speed of studying is mainly controlled by institutional factors.
(H7) If problems arise during the studies, they mainly originated in the personality, i.e., in social and mental variables. If the burden and stress caused by such problems are not eliminated, institutional factors as well lead to dropping out.

(H8) By means of specific and institutional measures, dropping out may be prevented even in mental problem cases.

(H9) Even though the entire system changes cybernetically and adapts itself, this is of little practical significance because of the excessive periods of retardation. Changes must therefore be supported specifically from outside.

Transferability on an International Level

The transferability of results and methods commanded particular interest. The expert confrontation on this project in Baden/Austria (May 2-3, 1974), the report of the OECD evaluator, Bretscher (1975), as well as the presentation and discussion at the 2nd General Conference OECD-CERI-IMHE in Paris (January 20-23, 1975) concentrated on this problem.

Results can be transferred—nationally and internationally—only cum grano salis. Experts from the Scandinavian and Benelux countries, France, Switzerland, and Germany found that the following summary of results corresponded to their experiences despite different systems of studies in their countries.

1. The beginning of studies, i.e., the adaptation of the student to the institution "university," is of decisive importance.
2. The stüdy pattern is largely constant.
3. Success groups of students can be clearly defined.
4. On the basis of the continuous examination results, indicators can be established at an early date which discriminate between these groups.

The transferability of the methodology developed depends, as generally assumed, not so much on different ministerial study regulations and types, such as the detailed elaboration or academic study regulations, but rather on the extent of *intermediate* results obtained before the student completes one section of studies. In the absence of academic study regulations many questions would have to be answered by comparing average study patterns of earlier semesters.

In the meantime, the cantonal government of Geneva has decided to use the above methods at the University of Geneva.

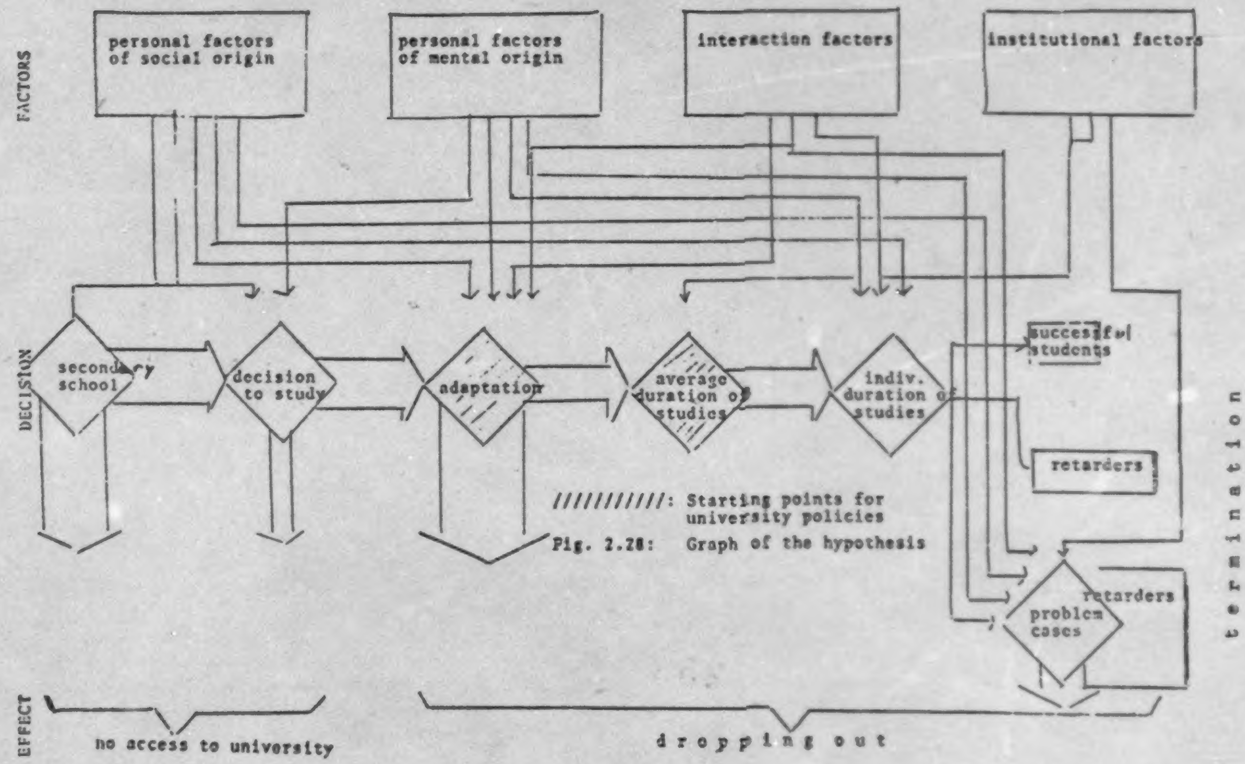
The National Institutionalization

A second phase of the project will be carried out in 1975/76, mainly concentrating on the possibilities of transferring the methods developed to further universities. In addition, various seminars, lectures, and training courses will deal with a continuation of methodological basic research and training.

The second phase of the CERI project is paralleled by the project "Central University Data Bank" (head of the project: E. Reichl). The target scheme for it has been laid down in the system scheme for the future use of EDP in the university administration (Reichl & Traunmueller, 1974).

Thus, a national strategic information system "Stüdienbereich" will be available for the university management by the end of 1976.

Figure 5
A GLOBAL THEORETICAL MODEL OF THE STUDY FLOW


FACTORS
personal factors of social origin
personal factors of mental origin
interaction factors
institutional factors
DECISION
secondary school
decision to study
adaptation
average duration of studies
indiv. duration of studies
successful students
retarders
problem cases
retarders
termination
//////////: Starting points for university policies
Fig. 2.28: Graph of the hypothesis
EFFECT
no access to university
dropping out

STUDENT SUCCESS

Bretscher, R. *Measuring student success: A systematic statistical analysis—evaluation report.* Paris: OECD Document IMHE/GC/74.41-A, 1975.

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THE CORRELATES OF UNDERGRADUATE STUDENT ATTRITION AT THE UNIVERSITY OF MIAMI (FLORIDA)

Matt W. Steele, University of Miami

The two basic variables which determine a university's enrollment are the number of new students who matriculate each year and the retention rate of students after matriculation. In a period of declining enrollment of new students the only possible means of maintaining a constant enrollment, not to mention increasing the enrollment, is to increase the retention rate of students. The purpose of the present study was therefore to determine the possibility of increasing retention. It was recognized that it is often necessary for students to transfer in order to find an environment more suited to their needs and abilities. Thus, our objective was to try to be as certain as possible that no aspects of the university environment which might be changed were causing students to transfer who might otherwise find the university suited to their needs and abilities. Obviously some of the most important characteristics of a university cannot easily be changed. The most significant aspects of a university as far as any one student is concerned are the overall characteristics of the faculty and of the other students. Astin (1965) devised a classification of universities which was largely based upon the proportion of degrees granted in each academic area. Such proportions are determined by an interaction of student and faculty characteristics. The characteristics of the students and of the faculty are clearly the most important features of a university, but at the same time they are the most fixed and unchanging aspects. However, certain relationships between students and faculty, such as academic advising, might be subject to change. In addition there may be other aspects of university life which are related to retention and which are also amenable to change. It was, therefore, felt that it would be worthwhile to attempt to determine if such specific entities as cafeteria services, library services, recreational opportunities, dormitory life, academic advising, and so forth were related to retention.

There are many outstanding examples of research in the area of student retention, but most of them, of which we were aware, had an objective which was somewhat different from our objective; we, therefore, could not duplicate their methods in order to accomplish our objective. Mock and Yenge (1969) compared persisters and non-persisters on the basis of scores made on academic and personality variables. They also compared the attitudes of persisters and non-persisters toward campus characteristics; and these comparisons were quite similar to the ones used in the present study, although specific student services such as cafeteria services were not included. Langlois (1972) surveyed non-returning graduate students in regard to their reasons for not returning. Such a method is also similar to the method used here, but we found it necessary to survey both returning and non-returning students. Some of the predictors of persistence found by Astin (1972) were high school grades and scores on tests of academic ability, being male, being a non-smoker, and having high degree aspirations at the time of matriculation.

Such findings are obviously vital in the basic research concerning retention; but in relation to the present study they demonstrate the reality that the student characteristics at any one university are relatively fixed, and that if anything is going to be changed in the interests of increasing retention it must be some other aspect of the university.

In summary, the purpose of the present study was to find aspects of the university environment which might be related to retention and which also might be subject to change by the cooperative efforts of all groups involved, if there were some evidence that such changes might increase retention. An implied additional purpose of equal importance was to locate areas of university life which were *not* related to retention. Thus, at a minimum it could be known where *not* to invest university resources in programs designed to increase retention; and at most it would be known where such programs would have the greatest possibility of success.

Method

The first method considered was simply to determine the extent of student dissatisfaction toward a wide range of aspects of university life and then assume that these areas were related to retention. It is obvious, of course, that if persisters are just as dissatisfied as non-persisters, then dissatisfaction toward the area is not related to retention even though all students combined may be highly dissatisfied. On the other hand, even if students indicate high satisfaction toward a certain area, the non-persisters may be significantly less satisfied than persisters, and consequently the area would be related to retention even though all students combined indicated high satisfaction. It, thus, became evident that it would be necessary to compare persisters to non-persisters in regard to attitudes toward the various areas of life at the university. Ideally, such comparisons should be made by administering the questionnaire during one fall semester and waiting until the next fall to ascertain which students were persisters and which were non-persisters. Also, questionnaires could be mailed during one fall semester to students who had enrolled during the previous fall and had either returned during the fall in question or had not returned. Both of the above procedures require identification of students by name. In the present study it was felt that students should not be asked to identify themselves, primarily because many might refuse to respond, and, thus, bias the sample. In addition those who would complete the questionnaire and identify themselves might feel that such a request was improper under the circumstances and also might not be as completely candid in their answers, thus obscuring the real relation between their attitudes and retention. We were, therefore, led to choose a third method of administering the questionnaires. We decided to administer them to all enrolled students and include in the questionnaire a question as to the students' plans to return or not to return the following fall. Seniors who indicated that they were not returning because of graduation would not be included in the data analysis; this method, of course, has the disadvantage that students may change their plans about returning.

Four questionnaires were designed which included 31 questions concerning university life in three major areas: academic, social, and student services. Each questionnaire included a question concerning plans to return or not to return to the university. Each question was answered by selecting one point on a five-point scale representing degree of satisfaction, degree of adequacy, or probability of return. The questionnaires were administered in the Fall and Spring of 1972-73 by meeting students at selected campus locations (outside of classrooms) and requesting each student to complete one of the four questionnaires. A sample of from 600 to 800 students at all academic levels was obtained for each questionnaire. However, in the analysis done for the present study, only degree-seeking undergraduates were included. The percent of students who refused to complete a questionnaire after being asked to do so was estimated to be less than 10%. In a number of earlier surveys it had been found that samples of students selected in the same campus locations have been representative of the entire student population within acceptable probability ranges.

Results

Each question concerning attitudes toward an area of student life was correlated, in a 2 x 2 chi-square test, with plans to return to the university. If the chi-square test was significant at $p<.05$, the area in question was assumed to be correlated with retention on a non-chance basis and the degree of correlation was derived by calculating the Contingency Coeffecient. Since all of the chi-square tables were of the same dimension (2 x 2), the Contingency Coeffecient could be used to compare relative degrees of correlation across all areas.

In Table 1 the areas are grouped by perception of progress, faculty, planning assistance, and social life. Within each group the areas are ranked from the highest relationship to retention to the lowest relationship as indicated by the Contingency Coeffecient. The three columns under "Percent Dissatisfaction" include the percent dissatisfied for persisters and non-persisters combined and also include the percent dissatisfied for each of these groups separately. A total of 12 areas were found to be correlated with retention.

In Table 2 the areas of university life which were *not* correlated with retention are given. They are grouped by student services, residence halls, planning assistance, and concern about finances. Within each group the areas are ranked from high to low according to the percent of dissatisfaction for returning and non-returning students combined. There was no need to indicate the percent dissatisfaction for returning and non-returning students separately; since the differences in percent dissatisfaction between the samples of two groups for each of these items was not significantly different at $p < .05$, it was necessary to assume that they were equal in percent dissatisfaction. A total of 18 areas were found not to be correlated with retention.

It can be seen in Table 1 that the students' perception of progress toward academic and career goals had the highest correlation with retention. The overall dissatisfaction with progress toward academic goals was relatively low (25%); however, 45% of the non-returning students expressed dissatisfaction toward academic progress, while only 16% of the returning students were dissatisfied. The same general pattern of responses occurred for the four items related to faculty—a relatively low overall percent dissatisfaction with faculty, but significant differences in dissatisfaction between returning and

Table 1
AREAS OF STUDENT LIFE WHICH WERE CORRELATED WITH RETENTION

	Percent Dissatisfaction			Contingency
	All Stds.	Stds. Leaving	Stds. Returning	Coefficient
Perception of Progress				
1. Toward Academic Goals	25%	45%	16%	.285
2. Toward Career Goals	26%	47%	18%	.285
Faculty				
3. Quality of Faculty	23%	38%	18%	.192
4. Availability for Consultation	29%	43%	24%	.185
5. Quality of Courses	22%	32%	19%	.126
6. Involvement Outside Class	57%	73%	55%	.125
Assistance in Planning				
7. For College Expenses	43%	59%	38%	.181
8. For Careers	47%	60%	41%	.161
9. Selecting Major Courses	37%	46%	33%	.119
10. Selecting Non-Major Courses	50%	59%	46%	.119
Social Life				
11. In Residence Halls	63%	79%	60%	.146
12. Friendliness of Students	45%	59%	43%	.113

non-returning students. In the area of assistance in planning, four items were correlated with retention while, as can be seen in Table 2, three items in the planning assistance area were not correlated with retention. The planning assistance items were designed to be component areas of academic advising. However, the item phrased "academic advising" was itself not correlated with retention (see Table 2). Another somewhat inconsistent finding was that "assistance in planning for college expenses" was correlated with retention, while "concern about financing college expenses" was not correlated with retention. Although 64% of all students expressed concern about finances, the ones who planned to return showed as much concern as those who planned to leave. In the area of social life, two items were correlated with retention—social life in residence halls and "friendliness of students."

In Table 2 it can be seen that none of the service areas were correlated with retention, although the dissatisfaction of all students combined reached a high of 81% in the case of administrative services. Three areas of life relating to residence halls were not correlated with retention, although one of them, "suitability for study," was found to be unsatisfactory by 64% of all students combined.

In Figure 1 two bar graphs are shown as an illustration of the fact that an area toward which all students (persisters and non-persisters) show relatively low dissatisfaction may be related to retention. In the case of faculty, only 22% of the students expressed dissatisfaction, but the non-returning students were significantly more dissatisfied (32%) than were the returning students (13%). On the other hand, 81% of all students expressed dissatisfaction with the administration, but the

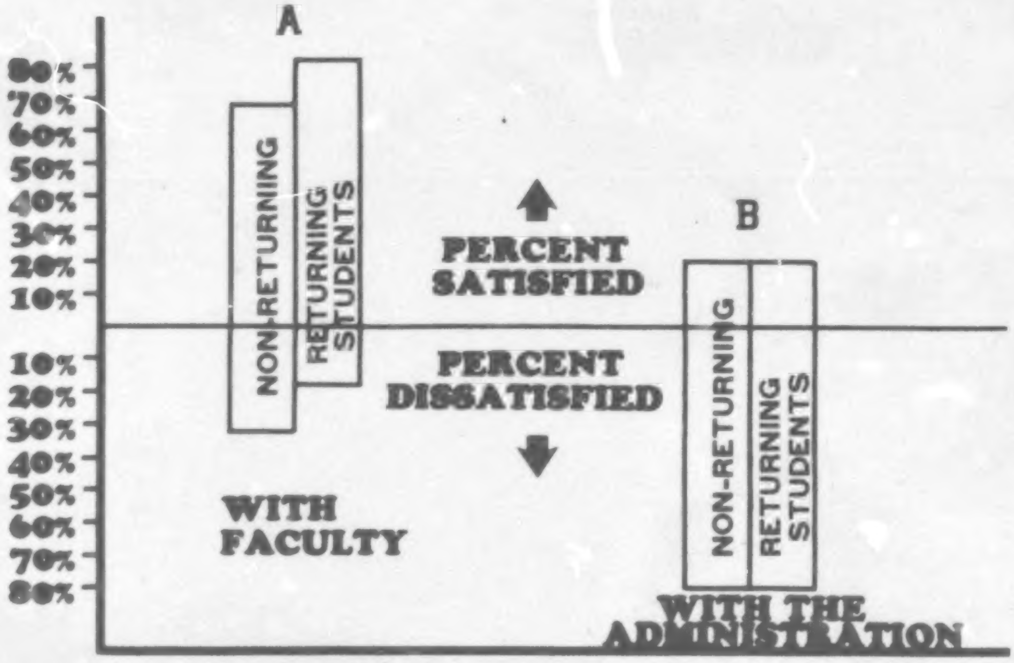
Table 2

AREAS OF STUDENT LIFE WHICH WERE NOT CORRELATED WITH RETENTION

		Percent Dissatisfaction for all Students in Sample Combined
Student Services		
1.	Administrative Services	81%
2.	Services for Commuter Students	71%
3.	Information Concerning Services	63%
4.	Registration for Courses	55%
5.	On-Campus Recreation	49%
6.	Health Center	41%
7.	Cafeteria Services	40%
8.	Guidance Center	39%
9.	Security Services	36%
10.	Off-Campus Recreation	28%
11.	Library Services	15%
Residence Halls		
12.	Suitability for Study	64%
13.	Residence Hall Staff	40%
14.	Compatability with Roomate(s)	16%
Assistance in Planning		
15.	For Degree Requirements	46%
16.	Selecting a Major (not courses)	43%
17.	Academic Advising (overall)	43%
Financing College Expenses		
18.	Concern about Ability to do so	64%

Figure 1

COMPARATIVE CORRELATIONS OF FACULTY AND ADMINISTRATION



returning and non-returning students were not significantly different in their expressed dissatisfaction toward the administration. Both groups were highly dissatisfied, but since there was not a significant difference between their percent of dissatisfaction, dissatisfaction with the administration was not by itself a cause of student attrition. In spite of the relatively high satisfaction expressed toward faculty, it was an area which was related to retention.

In interpreting the results of this study it should be borne in mind that the presence of a correlation between attitudes toward an area and retention does not imply that dissatisfaction toward the area is causing students to leave. The presence of a correlation does mean that the area is a likely candidate for causing attrition. However, the absence of a correlation implies that the area by itself is *not* a cause of attrition.

Discussion

The objective of the study was to locate areas of university life which might be subject to change and which also might be related to retention. An additional objective was to locate areas of university life which were not related to retention. The results indicate that the entire area of student services was not related to retention and, therefore, none of the service areas were individually the cause of attrition.

Unfortunately the areas of university life which were related to retention are less amenable to change than the student service areas would be. However, it seems clear that the major correlates of retention are in the academic area; and it is of some value just to know this, since initially it was assumed the causes might be in either the academic or non-academic areas. Additional studies would be needed to proceed with certainty in defining the specific elements of the academic area which might cause attrition, although hypotheses for such studies are possible. That starting point of an hypothesis would seem to be an examination of what is included in progress toward academic and career goals. Certainly the existence of such goals would be necessary in order for progress to be made toward them. Possibly more active steps should be taken to make more students aware of the range of career goals which are open to them and of the various academic paths leading to such career goals. With greater knowledge of the range of possible goals, the probability of at least having a goal would be increased. Also, many students may lose interest in their original goals and need assistance in selecting alternative goals. In general the present results indicate that additional studies in the field of student planning assistance and the relation of such planning assistance to progress toward academic and career goals would be most likely to yield information concerning the causes of attrition.

Conclusion

The basic conclusion is that the correlates of retention are primarily in the academic area and, furthermore, that such correlates are related to progress toward academic and career goals. However, these conclusions apply only to one university. The aspect of the study most likely to be of value to other universities is the methodology by which any college or university may assess specific areas of its environment for possible correlates of retention. Also many variations and improvements of the methodology described here are possible. Examples would be the use of factor analysis, more specific definition of areas of the environment and comparisons based upon actual return to or departure from the university, rather than upon plans to return or depart at some future date.

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STUDENT REACTIONS TO COLLEGE: HOW STUDENTS FEEL ABOUT THEIR COLLEGE EXPERIENCES

Walter T. Schöen, Jr. Educational Testing Service

Alienation may replace sex as the most popular subject at cocktail parties if psychoanalyst Alfred Messer (1968) is correct. "Campus upheavals and union struggles are symptomatic of our times and of the general confusion and feeling of estrangement" (p.5) he argues, while others, speaking from a different perspective, believe campus upheavals were not rebellions. "This is not a rebellion," they say. "We are not a rebellion. We are not necessarily fashioning ourselves as a sort of anti-image to our parents. It's just that we have grown up in an environment that was very, very different from the depression, and we're entirely different people. See, it's not a rebellion - it just happened" (Norowitz, 1968, p.20).

Whether they were rebelling, or whether it was just a happening, the 1960s and the early 1970s saw students expressing themselves in dramatic, sometimes violent, ways. At about that time, a group of congressmen visited a number of campuses across the country, talking with students to see if they could determine for themselves the reasons for the tensions that had been causing campus unrest. Their report to the President of the United States concluded that "on campus after campus we found widespread criticism from students who feel unable to communicate with administrators and faculty. They believe that no channel is open to them to make their views known (Congressional Record, 1969).

Although today's students may be less vocal, certainly less demonstrative, the need for creating a logical, systematic way for them to express themselves has not diminished. Open admissions has opened the doors of postsecondary education, and, according to Cross (1973), we now have new kinds

> of students with new needs on our doorstep and we aren't quite sure that we know what to do with them . . . students differ in consistent and significant ways from the students that higher education has served in the past.

Their abilities differ; their expectations differ.

As we think about serving this new clientele, we need to be aware of the student as consumer, and we need to determine how students are reacting to their educational experiences. From a pragmatic point of view, we should be aware that in a world of competing demands or options for learners, we must address ourselves to the needs of the student-consumer.

Moreover, from a philosophical perspective, we need to do this because we exist *only* because students exist, and we have an obligation to determine to what extent we can, and should, adapt our institutions to the needs of the learners.

The new clientele brings with it changes in attitude toward occupational choice, toward modes of instruction, toward extra-curricular activities, and toward all of the areas which are of concern to them as students. Since these attitudes may change substantially in a very short time, the concerned institution will want to consider institutional self-study as a continuous process, and may wish to periodically sample student opinion in order to determine the perceptions of students toward institutional programs and services, and in order to make decisions about revision only after thorough consideration.

Student Reactions to College (SRC) was developed for the primary purpose of providing students a vehicle for systematically expressing their views. Systematic, nonthreatening and anonymous expression is probably far superior to the intuitive approach, and provides the college—its faculty, administrators, trustees—information of considerable value about day-to-day activities, and can be very useful in longrange planning activities. In contrast to the typical inquiry, SRC provides a method for permitting students to express themselves about areas of concern to *them*. A 150-item questionnaire, with space for 20 locally written items, SRC items focus on 10 major areas: instructions and classroom experience, studying, student goals and planning, counseling and advising, administrative regulations, class scheduling and registration, student activities and cultural affairs, living, faculty contact, and library and bookstore.

In the spring of 1974 SRC was pilot tested in 22 publicly supported two-year colleges in the United States, and one two-year Canadian institution. The colleges were distributed geographically across 13 states, and ranged in student population from 250 to about 6200. Although originally created for use by two-year institutions, it is our belief, based on work with a number of four-year institutions, that the items have equal relevance for those institutions, and a slightly modified four-year version will be available shortly. With the exception of 4 of the 150 items, the current version may be used at the present time.

How Samples Were Chosen

Colleges which participated in the pilot project had, in some cases, expressed an interest in SRC; others were invited to participate. Although we attempted to achieve geographical balance, as well as a balance of innercity and suburban institutions, the basic college selection included an element of self-selection. At least one institution was almost entirely black, and five institutions were primarily Mexican-American. This paper does not reflect differences between types of institutions.

The student samples at each institution were chosen by the institution, as were the subgroups and method of administration. We attempted to have a minimum N of 500 at each institution, but the N varied both in numbers and percentage of the total student population.

Form of Administration

Most institutions administered SRC during regularly scheduled class periods. Several institutions used a mail process, and these institutions encountered some difficulty in having completed questionnaires returned to the institutional researcher. All responses were anonymous.

Usable responses were received from about 7500 students, of whom 50% were male, 44% female, and 6% either did not know or did not indicate sex.

Ages tended to be distributed across a broad range, with the largest group of students (41%) in the 18-19 age category. Fourteen of the respondents were 60 years of age or older. Almost one-quarter of the respondents were married, 11% indicated they were Afro-American, Negro, or black; 10% were Asian, Asian-American, or Oriental; 7% were Native American; 5% were Latino, Chicano or Mexican-American; and 55% identified themselves as being Caucasian or white. Of the students 29% were enrolled for fewer than 12 credit hours, and 83% had been enrolled at the college at least one previous semester. Almost one-fifth of the students in the sample were veterans. The students were distributed across a broad spectrum of curricular enrollments, but 43% indicated that completion of the program in which they were enrolled eventually led to at least a baccalaureate degree. Over one-fifth of the students were employed full-time, and another two-fifths were employed part-time.

In analyzing and presenting results, several considerations become important. I have tried to emphasize the important feelings of the 7500 students, while recognizing sizable minority disagreements when they occurred. There are no magic numbers. A 15% unfavorable response in one institution may be considered to be acceptable by one institution, highly unacceptable in another. The instrument should ideally be used to identify areas of concern which require further investigation by the institution.

While this paper includes responses to the original 171 items, there are a number of items which seem to have particular relevance or importance. Let me begin with items relating to *Instruction:* While 37% of the respondents indicated their instructors almost never had trouble understanding the students' problems, 61% of the students said this was the case at least sometimes. Sixty percent said their instructors often or almost always geared instruction to the students' interests and abilities (only 7% said this was almost never the case); 38% said instructors often or almost always had been unable to explain a topic in a way students could understand; 69% thought instructors often or almost always respected student points of view different from their own (only 5% said this was almost never the case). When asked whether instructors really listened to student questions and discussions in class, 70% of the students said instructors often or almost always did, while 5% said their instructors almost never did. When asked whether instructors had been clear about what they expected of students, most students said the expectations were clear, but 25% disagreed. Students felt that instructors expected more of students outside of class than they were able or willing to give, as 70% believed that to be the case in varying degrees. In a similar response, 30% believed instructors often or almost always piled on the work without concern for the students' other academic responsibilities, and another 30% said this was the case sometimes. Most students thought instructors returned exams and papers with grades and comments soon enough to be helpful to them, although 15% said their instructors did not do that. Most students did not participate in a course-related activity off campus, but it was interesting to note that 60% were interested in combining practical work experience with their formal academic program, and were even willing to extend the time necessary to complete degree requirements to do so. The majority of students felt they knew how well they were doing in their courses before they received grades. College course placement seemed to be working, for most students, but 17% said they were in classes that went over material they already knew.

Counseling and Advising

Students were dissatisfied with ease with which accurate information was obtained—50% feeling they had been sent from one office to another while trying to obtain information. Forty-one percent had *not* talked with counselors about future plans, but 21% said they had tried unsuccessfully to meet with a counselor, and 81% had met successfully with faculty advisors. Wrong or incomplete information about programs or courses was given by a college staff member according to 29% of the students. Another 37% said they needed help with problems connected with college attendance but were unable to get that help.

Registration and Class Scheduling

Getting into classes was still a problem for some. Registration procedures were a real burden for 40%, although almost half had no such problem. Twenty-two percent said they did not get the classes they wanted, and 35% had been prevented by scheduling problems from taking required courses. The majority did not feel that required courses had kept them from enrolling in other courses; 29% dropped a course because it was not what the student wanted; 72% said prerequisites did not prevent them from taking courses they wanted and, indeed, about 70% were in courses they wanted, 70% had no problems with rigid drop or add requirements. Surprisingly, 45% wished to use a computer to cut down on form-completion time, a majority wanted the freedom to enroll in courses they thought they could handle, without regard for F-test scores or previous grades, and 43% would add more days to the calendar to allow students more time to work out their programs.

Student Activities

The majority favored a student-run office, supported by student fees, for advice concerning housing, drugs, birth control, and other non-academic concerns. An overwhelming 74% favored cultural events on campus—only 9% were opposed. Almost half favored more activities for married or older students; only 13% said organized social activities were not necessary, but 38% said students do not care about much except getting through college, and the same percentage said they did not need the extra-curricular activities. Student government received reasonably good grades. Student government at least sometimes effectively represented the viewpoint of 73% while 21% said this was almost never the case. As in some other areas, students had mixed feelings about student activity fees: Fees should be abolished for support of student activities, athletics, student newspaper in the view of 39% of the students, 33% supported them, and 24% were not sure. Leaving control of students' out-of-class activities entirely to students was desired by 51%, and the majority also were opposed to disciplinary action for students' off-campus illegal activities. For students in two- as well as four-year institutions, thinking and planning for the future might be an obvious concern. In our study, 54% had not looked through occupational information to learn more about job possibilities after graduation. Interestingly, exactly 54% also said they needed more information about what the job market would be like when they left the college. They felt reasonably comfortable (the majority felt they were getting what they needed from the college), however, as 65% believed that the courses in which they were enrolled were pretty closely tied to future job plans, and when asked whether they knew what they wanted to do upon completion of their program, 63% said yes (26% of these said definitely yes), 17% said they did not know, and 19% were unsure. It is somewhat unclear what role the college played in these decisions. For example, when asked whether their occupational plans had changed since they started their college programs, 30% said they had, but 57% said their plans had not changed. Of the students 46% said they did *not prefer* a field of study with more definite job possibility than their present field, while 26% said they would like such a field. Interestingly enough, only 12% said they would change their field if making that change would not delay program completion (68% said they would not prefer to change). How satisfied were they? Fifty-nine percent said the college was set up to give them what they wanted, 22% said it was not and 20% did not know. When asked later in the questionnaire whether they thought the program of courses for which they were involved was not really what they wanted, only 16% responded positively.

How Did They Feel About Administrative Regulations?

They were about evenly divided—46% said they had had to go through a long senseless administrative process, but 51% said they had not. One-fourth felt they had been inconvenienced by an administrative error, and 27% said that administrative regulations had kept them from doing something they wanted to do; 37% had been angered by some administrative action, but only 19% said publications were too lightly controlled by the administration. An overwhelming 85% said the rules and regulations were pretty relaxed—and as a result they did not feel hassled. Nevertheless, about one-fourth thought the rules and regulations were made without student consultation, but there were still pleased—with only 13% stating the campus was *not* a friendly, comfortable place, and although 40% thought it was difficult to get their concerns known and acted on, only 6% said they were not given the respect and responsibility of adults. There were some interesting reactions to items relating to campus freedom. For example, while 29% favored student groups organizing and meeting on campus without administrative permission, 37% were against such a concept. Most students were not in favor of denying permission to non-students with extreme political or social views speaking on campus, but 15% were in favor of such a restriction.

Library, Bookstore

Library hours satisfied 80%, while 64% were generally well satisfied with library services. Fifty-five percent were well satisfied with the bookstore, although 20% were dissatisfied.

Living

About one-fifth of the students were seeking work and wanted help in finding a job. In a related question about dropping out because of money problems, 25% said they had given it serious thought, but 74% said they had not. Costs of books and supplies have been a problem for almost half of the students. Information about what is going on at school has been easy to get for most students. Perhaps reflecting the returning mother-student, one-fifth asked for a child care center on or near campus.

Students Would Like

Students wanted class assignments where several students worked together, but were split on the question of independent study, with 45% indicating their preference for at least one such course, 27% not sure, and almost 20% against. They preferred grades based on day-to-day work rather than on a few exams and seemed to want to know how well they did compared to other students. Only 34% asked for non-graded courses, while 41% were opposed to non-grading. They did, however, indicate strong interest in credit by examination, over 60% favoring that option. When asked whether they preferred written comments rather than grades, only 22% were in favor, 51% were opposed, and 26% did not know. Students had mixed reactions to the concept of having student records and transcripts show only courses successfully completed, with 30% in favor, 39% opposed, and 26% with no opinion. Apparently the same 30% wanted to record only grades in the student's major field, and 39% were also opposed to this. Only 15% were in favor of permitting a student to drop a course at any time without academic penalty. Most students thought the faculty were well-prepared for class, but 30% said instructors had been unprepared at least once. The students were evenly divided when asked if they thought their courses were taught too much like high schools—46% saying yes, 46% saying no. Students generally felt help with studies was available when needed, and about 30% asked for a place on campus where study with other students was possible. The need for a place to study without being disturbed was indicated by 44%, another 30% said that was not a problem for them.

How does one summarize these findings? I find it quite difficult to accurately capture the prevailing attitude, but some points were quite clear:

1. Students felt instructors had trouble understanding student problems.
2. Students said instructors tended to gear instruction to students' interests and abilities.
3. Almost two-fifths said instructors had been unable to explain a topic in ways understandable by students.
4. Most students thought instructors respected points of view different from their own.
5. Most students thought instructors really listened to student questions and discussions.
6. Most students said instructors were clear about what they expected of students.
7. Students thought instructors expected more of students outside of class than they were able or willing to give.
8. Students tended to think instructors piled on work without concern for the students' other academic responsibilities.
9. Most students thought instructors returned examinations and papers with grades and comments soon enough to be helpful to them.
10. Although most students did not participate in a course-related activity off campus, 60% were interested in combining practical work experience with their formal academic programs, and were even willing to extend the time necessary to complete degree requirements to do so.

Generally, students thought courses were pretty closely tied to future job plans, they knew what they wanted to do when they finished, rules and regulations were generally relaxed, and most are not uncertain about what they are getting from college. The campus was perceived as being a friendly, comfortable place to be, and the majority felt that the college was "set up" to give them pretty much what they enrolled for.

I would have to be optimistic, once again recognizing that where even small percentages of students are unhappy or dissatisfied, the wise institution will make further inquires concerning that dissatisfaction. SRC was designed to reflect areas of concern considered to be most important by students and staff members interviewed in its conception, and to represent areas in which a college has some freedom to act in order to modify existing situations which may be undesirable. As one regional accrediting commission's draft report indicated, if the efforts expended in self-study are to be justified, some kind of action should result. At the very least, SRC responses should give campus planners and decision makers something to think about.

A copy of the questions and the responses may be obtained from the author.

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THEY DO COME BACK!
ENROLLMENT TRACKING AT THE COMMUNITY COLLEGE

E. Timothy Lightfield, Mercer County Community College

The Focus Upon Student Enrollment Patterns

The study of student enrollment among colleges and universities traditionally has focused upon student attrition. Student attrition is considered a serious problem because of the human resources loss and because of the attendant financial expenses for educating individuals. If the student drops out of college prior to completion, a community or the larger society has assumed a financial burden without the requisite reward of trained graduates.

By its own mission and design, the community college has made itself ripe for student attrition. Students in the two-year college, according to profiles by Astin (1972), are less likely than students in four-year institutions to persist, even though it requires only two years of study for an associate degree. Student attrition is a problem, therefore, to which the community college has fallen heir both intentionally and unintentionally. The community college was established, among other reasons, to meet expressed community needs not supplied by other agencies. There also is the commendable aim of the two-year college to salvage residual but undeveloped talent and to enable persons to repair academic deficiencies before producing to their capacity. Furthermore, open admissions guarantees a heterogeneity in student characteristics and in the variables—socio-economic status, aptitude, motivation, academic achievement—most often referenced as determinants of attrition.

The phenomenon of student attrition, therefore, carries with it the concern of all educators and citizens. The assumption is that maintaining a minimum attrition rate is a measure of institutional accountability. What constitutes the acceptance level for attrition, however, has not been agreed upon. Thus, the individual institution usually has had to decide its own operational criteria for success or failure in student attrition.

Numerous studies have been undertaken to learn the extent of student attrition nationally, at the state level, and within individual two-year colleges. Indeed, most educational institutions can present figures to indicate the extent of student persistence or attrition, no matter how such terms might be operationalized. Clark (1960) found that a total of one of every six entering full time students eventually graduates. On data presented from the directors of the American Association of Community/Junior Colleges, Thorton (1966) notes a national average rate of 50% student attrition between the first and second years of the two-year college. Montgomery Community College, Rockville, Maryland, reported that approximately 60% of those students enrolled during the Spring 1970 class returned to class the following Fall semester (Gell, 1973). City University of New York reported a 62% one-year retention rate for freshmen entering in September 1970, through its open door admissions programs (Healy, 1973). Finally, the NORCAL Research Group, a consortium of California junior colleges, in reviewing national statistics over an 8-year period, found that sophomore enrollments were approximately 48% of freshman enrollments (MacMillan & Kester, 1973).

Mercer County Community College has attempted to understand student attrition more fully, as it resolves to adopt an accountability measure of student presistence. Steps toward assuming responsibilities for eliminating or reducing the woes of student attrition must be based upon initial understanding of student enrollment patterns. The gross number or proportion of drop-outs, whether operationalized by academic periods or years, whether inclusive of all students or confined to matriculated full time students, cannot supply the complete information. Refined data on the patterns of student enrollment over extended periods of time are needed so that a college can develop requisite action programs and services.

Procedures—An Enrollment Tracking System

To meet these information needs, Mercer County Community College has developed a computerized tracking system which follows student enrollment by semester of entering class. This tracking system enables data retrieval for both full time and part time entering students for each semester for a period of six consecutive semesters after the initial term of enrollment—seven total semesters. This longitudinal design allows for interrupted studies, change of status from full to part time, and consequent delays in program completion beyond the four semester provision of a two-year associate degree.

The computer program generating the output is run after the registration changes have been processed onto the Student History File, usually about two weeks following the close of the late registration period each semester. A semester's run of the output presents data for that entering class and the entering classes for the prior six semesters. For example, the Spring 1975 program run consists of continuous enrollment tracking data on the entering class of Spring 1975, as well as Fall 1974, Spring 1974, Fall 1973, Spring 1973, Fall 1972, and Spring 1972.

A student's status is reported in 1 of 14 mutually exclusive categories: *Enrolled*—Returning Full Time, Returning Part Time, Full to Part Time, Part to Full Time, Re-Admit Full Time, Re-Admit Part Time, To Other Curriculum, Return Full Time From Other Curriculum, and Return Part Time From Other Curriculum; *Non-Enrolled*—Non-Return Full Time, Non-Return Part Time, Dismissed, Transferred, and Graduated. A cumulative figure records the number and percent of the entering class attending the College with each semester. In each semester's output, the entering class figure becomes the base upon which all percentage distributions are calculated.

The system produces output generated for each curriculum of the College and for all programs combined, and the output is produced separately for freshmen, sophomores, all students, and the operationalized subpopulations. The output for each individual curriculum also shows student movement between major programs, as well as change in student status from the freshman to sophomore level.

Figure 1 is an example of generated output from the computerized tracking system.[1] In this illustration, the aggregated enrollment patterns for the full time entering class of Fall 1972 (N= 1384) are traced through Spring 1975. According to the data provided, 72% of the full time entering class for that Fall 1972 semester returned to the College the next semester in a full time status, and another 7% returned part time, for a total attending figure of 79%. That figure then changed over the subsequent four semesters to reflect various persistence, attrition, and re-admittance patterns.

As a complement to the computer facilitated tracking system, the College surveys the population of non-returning students each semester. The survey is designed to provide empirically derived data concerning reasons for non-return and to discuss particular characteristics of these former students. To coincide with the survey instruments, programming was developed to enable data from the questionnaire to be tabulated, cross-referenced, and printed out by the College's computer. Through such a program, the survey results can be accessed for the entire sample of respondents and for identified subpopulations such as for particular curricula, departments, or categories of students.[2]

Access to the College's Student History File and Registration File has enabled retrieval of output exhibiting

Figure 1

STUDENT PERSISTENCE IN AND MODE OF LEAVING FULL TIME STATUS BY YEAR OF ENTERING CLASS

	ALL STUDENTS				CLASS ENTERING FALL, 1972		
	SPRG 72	FALL 72	SPRG 73	FALL 73	SPRG 74	FALL 74	SPRG 75
PERCENT		100.00					
ENTERED		1384					
PERCENT			72.20	45.50	36.60	7.60	5.20
RETURNING F-T			1000	631	507	106	72
PERCENT				1.00	2.70	2.20	3.00
RETURNING P-T				15	38	31	42
PERCENT			6.70	3.90	3.20	3.60	2.20
FULL TO PART TIME			94	54	45	51	31
PERCENT				1.40	.90	.90	.70
PART TO FULL TIME				20	13	13	10
PERCENT				1.20	1.80	1.10	.90
RE-ADMIT F-T				17	25	16	13
PERCENT				1.10	1.70	2.00	2.30
RE-ADMIT P-T				16	24	29	32
PERCENT		100.00	79.00	54.40	47.10	17.70	14.40
TOTAL ATTENDING		1384	1094	753	652	246	200
PERCENT				.50		17.10	.50
GRADUATED				7		237	7
PERCENT							
TRANSFERRED							
PERCENT			20.90	21.80	8.10	11.50	2.10
NON-RETURN F-T			290	303	113	160	30
PERCENT				3.60	2.10	3.30	3.40
NON-RETURN P-T				51	30	47	48
PERCENT				.90	.50	.50	.40
DISMISSED				13	7	7	6

Mercer County Community College

assorted demographic and biographical characteristics of the non-returning students for contrast with other populations. Such generated output, thus, gives the College a third source of information in its efforts to understand student enrollment patterns.

Application

Application of the computerized tracking system through the Spring 1975 semester indicates that the highest persistence rate at the one semester tracking point occurred with the Fall 1974 entering class= 79% returned full time and 84% returned either full or part time. Table 1 presents the percentage distribution summary of the persistence of full time student enrollment by semester and year of the entering classes. This exhibit facilitates a comparison of persistence data for each year from 1969 through 1975. Similarly Table 2 facilitates aggregate comparison of the persistence of part time student enrollment by year and semester of the entering classes from 1970 through 1975.

Further attrition results have come from the surveys of non-returning students. Findings from the survey of the non-returning student population of Fall 1973 to Spring 1974 (N= 299)[3] reveal that the majority of the non-returning students attended the College with a particular education objective. Characteristically the major objective was preparation for an intended occupation or for further education. According to survey results, over 80% of the non-returning students who were employed indicated that the College had prepared them well or very well for that position. Similarly, over 80% of these former students pursuing further education indicated that they had been prepared well or very well for that education.

The output data for the College also is viewed with respect to the patterns of intermittent enrollment. A number of students are pursuing an erratic or irregular pattern of enrollment, attending one semester, "stopping-out" for one or several semesters, and then returning to the College in subsequent semesters.[4]

Tables 3 and 4, derived again from the output data,

Table 1

PERSISTENCE SUMMARY OF FULL TIME STUDENT ENROLLMENTS BY YEAR OF ENTERING CLASS FALL & SPRING SEMESTERS, 1969-1975[a]

Full Time Students Entering In:	One Semester	Two Semester	Three Semester	Four Semester	Five Semester	Six Semester	Graduates By Sixth Semester
Fall 1969 (N= 1119)	69% (79%)	55% (59%)	46% (52%)	12% (17%)	5% (9%)	2% (3%)	29% (n= 322)
Fall 1970 (N= 1151)	69% (77%)	51% (58%)	41% (49%)	10% (21%)	8% (16%)	3% (7%)	25% (n= 287)
Fall 1971 (N= 1291)	75% (80%)	52% (60%)	45% (51%)	11% (20%)	8% (16%)	3% (8%)	32% (n= 412)
Fall 1972 (N= 1384)	72% (79%)	48% (54%)	40% (47%)	10% (18%)	7% (14%)		18% (n= 251)
Fall 1973 (N= 1368)	72% (77%)	51% (57%)	46% (53%)				1% (n= 13)
Fall 1974 (N= 1433)	79% (84%)						
Spring 1970 (N= 213)	64% (71%)	48% (58%)	30% (43%)	19% (30%)	4% (11%)	3% (10%)	27% (n= 58)
Spring 1971 (N= 250)	50% (61%)	35% (43%)	16% (26%)	10% (19%)	3% (9%)	2% (7%)	16% (n= 40)
Spring 1972 (N= 236)	52% (62%)	37% (48%)	17% (24%)	11% (20%)	4% (9%)	5% (13%)	17% (n= 39)
Spring 1973 (N= 274)	57% (65%)	41% (46%)	20%) (25%)	14% (20%)			5% (n= 15)
Spring 1974 (N= 245)	49% (59%)	42% (48%)					

[a] Persistence is measured by the number of students from the entering class returning or re-admitted full-time the subsequent semester (initial percentage figure) and by the number of students from the entering class returning full or part time the subsequent semesters (percentage figure in parentheses in each row).

Mercer County Community College, 18 February 1975

Table 2
PERSISTENCE SUMMARY OF PART TIME STUDENT ENROLLMENTS BY YEAR OF ENTERING CLASS FALL & SPRING SEMESTERS, 1970-1975[a]

Part Time Students Entering In:	One Semester	Two Semester	Three Semester	Four Semester	Five Semester	Six Semester	Graduates By Sixth Semester
Fall 1970 (N= 1178)	41% (44%)	24% (26%)	16% (17%)	14% (15%)	12% (13%)	10% (11%)	1% (n= 12)
Fall 1971 (N= 1097)	36% (39%)	20% (22%)	14% (15%)	10% (11%)	9% (9%)	8% (8%)	6% (n= 69)
Fall 1972 (N= 1330)	42% (45%)	23% (25%)	17% (17%)	13% (14%)	11% (12%)		1% (n= 12)
Fall 1972 (N= 1264)	34% (37%)	20% (23%)	18% (18%)				0% (n= 3)
Fall 1974 (N= 1621)	39% (41%)						
Spring 1971 (N= 661)	25% (30%)	15% (16%)	12% (13%)	10% (10%)	8% (8%)	8% (8%)	1% (n= 4)
Spring 1972 (N= 499)	24% (31%)	20% (20%)	14% (14%)	10% (10%)	8% (9%)	8% (8%)	2% (n= 8)
Spring 1973 (N= 825)	19% (24%)	13% (13%)	9% (10%)	9% (9%)			0% (n= 2)
Spring 1974 (N= 834)	27% (32%)	22% (23%)					

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[a] Persistence is measured by the number of students from the entering class returning or re-admitted part-time the subsequent semester (initial percentage figure) and by the number of students from the entering class returning part or full time the subsequent semesters (percentage figure in parentheses in each row).

Mercer County Community College, 18 February 1975

Table 3
RETURN AND NON-RETURN OF FULL TIME STUDENT ENROLLMENTS BY YEAR OF ENTERING CLASS FALL & SPRING SEMESTERS, 1969-1975

Full Time Students Entering In:	Semester Headcount Enrollment	RETURN Succeeding Semester		NON-RETURN Succeeding Semester		Re-Admittance In Subsequent Semester(s)[a]			TOTAL Non-Return To Date[b]	
		Full Time	Part Time							
Fall 1969	1119	769	113	237	21%	147	(5)	13%	90	8%
Spring 1970	213	136	16	61	29%	32	(5)	15%	29	14%
Fall 1970	1151	798	94	259	23%	159	(5)	14%	100	9%
Spring 1971	250	124	29	97	39%	44	(5)	18%	53	21%
Fall 1971	1291	974	65	252	20%	169	(5)	13%	83	6%
Spring 1972	236	122	24	90	38%	35	(5)	15%	55	23%
Fall 1972	1384	1000	94	290	21%	172	(4)	12%	118	9%
Spring 1973	274	156	22	96	35%	19	(3)	7%	77	28%
Fall 1973	1368	991	56	321	23%	61	(2)	4%	260	19%
Spring 1974	245	119	25	101	41%	3	(1)	1%	98	40%
Fall 1974	1433	1126	71	236	16%	—	(0)	—	236	16%
TOTAL	8964	6245	609	2040	23%	841		9%	1199	13%

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[a] The number of subsequent semesters for each entering class is in parentheses. Re-admittance may be as full or part time student.

[b] The figure is based upon the non-return data for the succeeding semester less the number of students from the original entering class re-admitted in subsequent semesters.

Mercer County Community College, 18 February 1975

enable examination of the degree to which intermittent enrollment has occurred. From the non-return rate for the succeeding semester after initial enrollment, the number of students re-admitted to the College in subsequent semesters is subtracted, thus arriving at a total non-return rate to date for that one-semester cohort of non-returning students.[5] The data indicate that approximately one of every two students who did not return to the College for the succeeding semester, eventually did return as re-admitted students in subsequent semesters. For example, a total of 1151 students entered full time in Fall 1970; of this figure, a total of 259 (23% of entering class) did not return in the succeeding semester. Of the 259 initial non-returning students, however, 159 students (61%) were re-admitted to the College in the four succeeding semesters.

Similarly, examination of re-admittance for the part time student population indicates that approximately 2 of every 10 students who did not return in the succeeding semester after initial enrollment to the College were re-admitted for subsequent semesters. For example, a total of 1097 students entered the College Fall 1971 as part time students; of this figure, a total of 670 (61% of entering class) did not return in the succeeding semester. Of that non-return total of 670 students, however, 140 (21%) were re-admitted to the College in the four subsequent semesters.

The intermittent enrollment pattern parallels findings from the College's surveys of non-returning students. Approximately 25% of the respondents from the non-returning student population of Fall 1973 to Spring 1974 indicated they plan to return to the College at a later date. Furthermore, 75% of the former students sampled plan to continue their education in the future, either at Mercer or some other postsecondary institution.

Application of the enrollment trackings also are made for the individual academic programs of the College for which specific data is generated. In examining data, such as one-semester attrition of full time student enrollment, comparisons are made of each program with the overall rate for each semester and with aggregated curricular groupings, such as academic departments. The comparison of persistence rates for identified entering classes, categorized according to programs or curricular groupings, provides potential indicators of curricular effectiveness. Examination of programs within these curricular areas has led to a concern for providing explanations for significant differences in attrition or persistence rates, as exhibited by this trend data.

Discussion

Through an information system consisting of computerized enrollment tracking, surveys of non-returning students, and retrieval of demographic characteristics of student populations from computer files, Mercer County Community College has come to revised understandings concerning student enrollment patterns. The results of the various information systems infer that a significant proportion of the non-returning student statistic has been due to intermittent enrollment, change in students' personal plans, and completion of personal objectives by former students, rather than to failure of the individual or the College. Consequently, from the proportion of the enrolled student population withdrawing from the College, those who eventually return and those who indicate completion of educational objectives are subtracted. As a result, the efforts of the College have shifted toward concentration upon reducing whatever degree of dissatisfaction is expressed by such former students and to set a goal of a minimal proportion level for the negative reasons which students have for non-return.

In examining trend data, one conclusion has been that the one-semester attrition rates have varied minimally for the Fall semester entering classes but not for Spring semester classes. Entering classes in Spring are comprised of students with identifiably different characteristics than entrants in the Fall and appear more susceptible to push and pull enrollment factors. The contrasts in these characteristics and persistence rates have consequences for the College in projecting enrollments and providing services and programs.

Table 4

RETURN AND NON-RETURN OF PART TIME STUDENT ENROLLMENTS BY YEAR OF ENTERING CLASS FALL & SPRING SEMESTERS, 1970-1975

Part Time Students Entering In:	Semester Headcount Enrollment	RETURN Succeeding Semester Part Time	Full Time	NON-RETURN Succeeding Semester		Re-Admittance In Subsequent Semester(s)[a]			TOTAL Non-Return To Date[b]	
Spring 1970	727	187	30	510	70%	91	(5)	13%	419	58%
Fall 1970	1178	484	34	660	56%	168	(5)	14%	492	42%
Spring 1971	661	162	33	466	71%	79	(5)	12%	387	59%
Fall 1971	1097	395	32	670	61%	140	(5)	13%	530	48%
Spring 1972	499	117	36	346	69%	77	(5)	15%	269	54%
Fall 1972	1330	553	40	737	55%	163	(4)	12%	574	43%
Spring 1973	825	157	42	626	76%	67	(3)	8%	559	68%
Fall 1973	1264	434	35	795	63%	79	(2)	6%	716	57%
Spring 1974	834	228	36	570	68%	44	(1)	5%	526	63%
Fall 1974	1621	626	38	957	59%	—	(0)	—	957	59%
TOTAL	10.036	3343	356	6337	63%	908		9%	5429	54%

[a] The number of subsequent semesters for each entering class is in parentheses. Re-admittance may be as part or full time student.

[b] The figure is based upon the non-return data for the succeeding semester less the number of students from the original entering class re-admitted in subsequent semesters.

Mercer County Community College, 18 February 1975

ENROLLMENT TRACKING

The College has recognized that completion of an associate degree within the six-semester provision of the tracking system is encompassing a lesser proportion of each entering class. Apparently, students in recent years are stretching their attendance patterns out and taking more than the assumed four semesters, or the extended six semesters, to complete a program or to withdraw from the College. The enrollment tracking system, consequently, has been extended to cover enrollment periods of ten consecutive semesters in order not to omit enrollment patterns which persist or which may develop after a seventh semester of enrollment.

The enrollment tracking system also has facilitated understandings about enrollment patterns of students internal to the College, including change of major. The degree to which the College or a program facilitates the change of major is examined. The information also alerts the College to the internal need for the evaluation of a particular program, when indicators suggest extensive student attrition or out-migration to other programs without commensurate in-migration from other programs.

For all practical purposes, the results of the complementary information system confirm that "drop-out" is not an appropriate term to signify students who did not return to the community college for completion of the intended program. Most non-returning students, as monitored to date, continue in their pursuit or return at a later time to complete their educational goals. Furthermore, many community college students intend to complete only one or several courses, rather than earn a degree. These students are not drop-outs after finishing the courses they intended to complete, because they have accomplished their goals. Others are not drop-outs because, after working for a few terms or traveling, they return to college without having forsaken their educational goals. If the community college is responsible for helping students develop viable life goals, then findings from our information systems suggest that a community college may contribute toward such goals of development even among its non-returning students.

Given the variables of college attendance discerned through this information system and the immense complexity of the pushes and pulls which affect a student's desires and abilities to enroll, it becomes debatable as to what is a good or poor student persistence rate. It has become obvious, at least to this College, however, that a student persistence rate approaching 100% should not be set, even as a potential goal. While attrition represents the potential loss of resources and a loss or postponement of trained persons for society, there is no clear evidence that non-return to college is necessarily harmful for the student or tragic in the individual's career pursuit (Hahn, 1974). There is no empirical justification for a claim that a completed associate degree is a pre-condition for job security or that the non-returning student is doomed to failure in life. In fact, an argument could be raised that a non-return of 16%, as registered for Mercer for the one-semester attrition of the Fall 1974 full time entering class, is too low a figure.

The careful monitoring of student re-admittance data also is an area where considerable attention has been placed by the College. Re-admittance data reflect students satisfied with the educational experience received but who postponed studies temporarily. A consistent reduction in the re-admittance figure, as potentially occurring for the Fall 1973 entering class of the College, could reflect more cause for concern than a sudden increase in the attrition figures.

A definite indicator of goal attainment for the College always has been the expressed satisfaction of graduates with the preparation received for employment (career) or further education (transfer). Previous to the analyses of student enrollment patterns and survey results, it was incorrectly assumed that the institution could not be judged on the basis of the reactions of non-returning students to a presumably incomplete preparation. In contrast to a study of university students which found satisfaction with the institution inversely related to remaining in college (Starr, Betz, & Menne, 1972), however, comparisons of satisfaction levels of non-returning students, persisters, and graduates has yielded no such differences for Mercer. The College, consequently, has identified as a similar indicator of goal attainment, the satisfaction of students who did not complete a degree or program—the non-returning students—with the preparation received.

Findings from the information systems have contradicted the stereotyped image of the non-returning student at the community college as marginal with a history of academic failure and frustration. Similarly, the findings consistently contradict the stereotype of the non-persister as a consequential failure and non-productive element of society. The vast majority of the non-returning students from Mercer expressed a definite and positive reason for attending college, planned to continue education either on the job or at another institution, and felt that college education was essential or important. Comparison of assorted demographic and biographic characteristics of the populations of non-returning students with persisters and with graduates reveals no significant differences. Beyond the questioned utility of any combination of identified predictors of the potential non-returning student at the community college (DeVecchio, 1972), Mercer has tempered efforts to provide action services and programs with the realization that attrition may not necessarily be a negative indicator of goal attainment.

What originated at Mercer County Community College for the purpose of concentrating upon student attrition has developed into a multi-dimensional system by which to track and understand student enrollment patterns. The monitoring of enrollment patterns of various entering classes has had real decision-making consequences at the College in terms of measuring accountability, predicting student non-return, extrapolating enrollments, evaluating curricula, determining cause and effects, and developing responsive programs and services to meet student needs.

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[1] Examples of other output from the computerized tracking system may be obtained by contacting the author.

[2] Examples of various output from this computer program for the survey of non-returning students may be obtained by contacting the author.

[3] A total of 543 full time students who were enrolled during the Fall1973 semester did not return for the Spring 1974 semester, exclusive of students who graduated or switched to part time status. After follow-up efforts, a total of 299 forms were returned completed, for a return of 55%

[4] Eckland (1964) was the first to provide empirical evidence of the dropout who comes back to college. During the 10 years after matriculation at the University of Illinois, Eckland found that 70% of the former students came back. Eckland's study, however, did not focus upon the community college, particularly colleges without admissions selectivity.

[5] The number of students re-admitted also is a function of the number of successive semesters for which the tracking system operates. Re-admittance is monitored only for the cohort of students who do not return for the semester after the term of initial enrollment.

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AIDING THE ARTICULATION PROCESS: A JUNIOR COLLEGE TRANSFER STUDENT INFORMATION SYSTEM

Gerald S. Leischuck, Auburn University

For junior college education in Alabama, the decade of the Sixties was one of conception, incubation, birth, and, to some degree, maturation. Prior to 1963 there existed in this state no public-supported two year colleges. Today there exist 19 state-supported junior colleges serving approximately 40,000 students, nearly one-third of all students enrolled in institutions of higher education in the state, and supported by an annual state legislative appropriation of $20 million.

Immediately following the passage in 1963 of enabling legislation, junior college sites were designated, facilities were constructed, and soon most were operational. The rapid development of such a system of junior colleges presented the senior institutions in the state, several of whom had evolved over time into somewhat selective universities, with concerns. Initially, questions were raised about the impact the junior colleges would have on the enrollment at the senior institutions. Very shortly, it became apparent that there would be no adverse effect; enrollment in senior institutions continued to rise. Subsequent questions related to the number of students who would be transferring, what they would be studying, and a subtle but overriding concern—how would the transfers perform at the senior colleges.

Auburn University was aware of its responsibility to assist in the development of this emergent system of junior colleges, and realized that its own academic programs would be affected by the quantity and quality of the transfers. Therefore, soon after the development of the system of junior colleges, the decision was made to develop a computer based junior college transfer student information system (JCIS), the chief purpose of which would be to aid in providing answers to the multitude of questions relating to the flow of students from all institutions in the junior college system to Auburn University.

In the conception stages, the goal was several fold. Not only was capability sought to provide answers to questions raised by faculty and administrators at this university; too, there was the desire that the JCIS possess capability to help personnel at each of the junior colleges in answering questions which they may have relative to extent and performance of their transfers. Also, as academic programs were being developed at the various junior institutions, programs at this university needed to be examined so that unforeseen barriers to transfer students could be removed. A subsequent unanticipated benefit of the system was realized by the leadership at the junior colleges as they sought for their institutions' initial accreditation by the regional accrediting association. Reliable information depicting the performance of former students at at least one major university could be utilized as supportive follow-up data.

Nature of the System

The computer based junior college transfer student information file contains pre-transfer data items placed in the file when the student enters the university and post-transfer information which is updated by interfacing the JCIS with the Auburn University master student information (SI) file. Initial input information includes items which identify the student, certain pieces of personal information, junior college academic information, and first-term post-transfer performance data. The specific items of data placed in the file and the card layout are presented in Figure 1.

Through computer programming it is possible to routinely retrieve from the master SI file and place in the JCIS various assorted pieces of data relating to post-transfer Auburn University academic performance. During the early development of the system interest focused on three major factors: at what rate were transfers entering, what were they studying, and how they were doing academically in relation to native students. Therefore, in the interface with the SI file, items placed into the JCIS related to these characteristics.

Figure 1

DATA INPUT AND PUNCH CARD LAYOUT

CARD COLUMN		DATA ITEM
1- 9		Social Security Number
10-29		Student Name
30		Sex
31-32		Junior College Code
33-35		Entering Quarter
36-37		ACT Composite Score
38-39	Pre-Transfer Record	Number of Quarters
40-42		Number of Hours Attempted
43-45		Grade Points Earned
46-48		Grade Point Average
49	Post-Transfer First Quarter Record	Classification
50-53		Curriculum
54-55		Hours Attempted
56-57		Grade Points Earned
58-60		Grade Point Average

Figure 2

POST-TRANSFER INFORMATION RETRIEVED FROM SI

Last Quarter Enrolled

Class Level, Last Quarter Enrolled

Curriculum (Major), Last Quarter Enrolled

Cumulative Academic Record, Last Quarter Enrolled (hours attempted, honor points earned, S/U hours, g.p.a.)

Academic Status (Graduated, Dropped Out, Currently Enrolled)

The Output

Figure 3 reflects a page printed from the JCIS. Contained there are all items in the file and their layout.

Four basic computer programs have been developed which perform analysis of the data on the JCIS at intervals after it is made current by the routine interface with the SI file. Most analyses are designed to reflect data separately for each of the junior colleges in the state system. The first produces a quarterly and annual summary of the rate of transfer from each of the junior colleges. Figure 4 depicts a portion of the summary. While initial year in the summary table is the 1965-66 academic year, the year transfers first entered this institution from the junior colleges, Figure 4 reflects only a portion of that period. Each time the summary is produced, it reflects the data as of the most recent quarter.

The second output document is a summary, again by feeder junior institution, which reflects program selection upon entrance on the part of the transfers. These data help administrators at our institution and faculty at the junior colleges to plan programs which interrelate and are capable of accommodating the transfers with a minimum of articulation inconvenience. Depicted in Figure 5 is an example of this summary.

The third summary output conveys information which amplifies on the data presented in Figure 5. This permits, on an annualized basis, an indepth examination of transfer student flow through the university. The analysis distributes those transfers who entered programs in one academic school (in this case Engineering) among all schools. The data are further refined to provide an analytical breakdown of the enrollment status of the student at that point in time.

Focusing on the junior college transfers who entered programs in Engineering, it can be seen that one changed to a program in Pharmacy and subsequently graduated. Of the Engineering entrants 14 transfered to programs in Agriculture; 6 were graduated, 3 dropped out, and 5 were currently enrolled at the time of this computer run. A similar analysis is provided for each academic school.

Figure 7 is a page from the fourth in the sequence of summaries. This contains, on an annual basis, an analysis of the relationship between pre-transfer and post-transfer academic performance for all transfers from a particular junior college (in this example, J.C. 06). The summaries are further refined to indicate performance by three sub-groups of students: graduated students, dropouts, and currently enrolled students.

One additional program has recently been developed which should be of invaluable assistance to curriculum planners at this institution as well as at the junior college. This analysis provides a distribution of grades in a selected academic program area for students enrolled for any quarter or group of quarters. This analysis, like the others, reflects stu-

Figure 3
THE JCIS FILE

```
                GOOD STAD  2    02         08    123   120  0.98  471  3EED  17   20  1.18
273   04EED     0.94     099    079   093  001   001                           273
                     GRAD. 2    02         08    106   273  2.57  172  1FA   16   28  1.75
474   04RSB     2.76     137    137   378  017   017                           474
                GOOD STAD  1    02    26   01    016   043  2.68  172  1GPS  17   20  1.18
272   01GPS     1.14     035    027   040  000   000                           272
                GOOD STAD  2    02         02    015   005  0.33  172  1EED  15   23  1.53
272   01EED     1.06     031    030   033  000   000                           272
                GOOD STAD  1    02    24   03    042   095  2.26  172  1BI   16   28  1.75
275   03IE      1.45     093    086   135  000   000                           275
                GOOD STAD  1    02    24   02    035   049  1.40  272  1PN   11   10  0.91
272   01PN      0.91     011    011   010  000   000                           272
                SUSP INDT  1    02    22   05    078   081  1.04  472  2OP   15   05  0.33
474   03LPO     0.48     077    048   037  000   000                           474
                GOOD STAD  1    02    26   02    020   045  2.25  472  1F    16   32  2.00
175   04INM     1.85     150    150   278  001   001                           275
                GOOD STAD  1    02         07    125   345  2.76  472  3L    18   31  1.72
472   03LE      1.72     018    018   031  000   000                           472
                GOOD STAD  2    02         06    097   194  2.00  472  2SED  16   25  1.67
175   04FCS     1.95     132    132   258  001   001                           275
                     GRAD. 1    02    21   05    071   094  1.32  472  1AG   18   36  2.00
175   04ADS     1.81     124    124   225  000   000                           474
                GOOD STAD  1    02         06    094   148  1.57  472  3PPY  13   16  1.23
373   03PY      0.75     028    019   021  000   000                           373
                     GRAD. 1    02    20   03    048   114  2.37  472  2HPR  18   31  1.72
474   04HPE     1.69     127    114   214  017   017                           474
                GOOD STAD  2    02         07    097   118  1.21  472  3HPR  17   13  0.81
173   03HPR     1.07     029    024   031  002   002                           173
                GOOD STAD  1    02    19   06    081   089  1.10  472  3VED  19   28  1.56
273   03VED     1.15     033    028   038  001   001                           273
                GOOD STAD  2    02         04    046   083  1.80  472  2EED  17   13  0.81
174   03EED     0.89     045    042   040  001   001                           174
                SUSP 2 QT  1    02         04    025   030  1.20  472  2PN   16   16  1.00
473   02PN      0.61     059    043   036  000   000                           473
               PROBATION   1    02         08    136   136  1.00  472  3P    15   10  0.67
275   03PL      0.84     126    089   106  001   000                           275
```

dent performance by feeder institution. The information as depicted in Figure 8 have only recently become available and it is at this time impossible to ascertain the extent of its use. The assumption is that these data will be of considerable interest at both types of institutions.

Discussion

The JCIS is routinely maintained on a quarterly basis in a joint effort by the Offices of Institutional Analysis and Administrative Data Processing. The initial entry and pre-transfer information is prepared for input into the JCIS by the staff of the Office of Institutional Analysis. Responsibility for routine interface of the JCIS with the SI is assumed by the personnel in the Administrative Data Processing Office; this office maintains all computer based files for the Office of Institutional Analysis. The computer programs are developed and maintained by Administrative Data Processing.

Annually, a summary report of the data in the JCIS is prepared for distribution to faculty and administrators on this campus and to the junior colleges. The report is designed to convey as much data as possible within the usual constraints of generalized audience interest and report size. Junior college identity remains shielded in all analyses which convey data for each of the institutions; however, the chief administrator of each institution is informed of the code which represents his institution.

There is now wide awareness on the part of the leadership within the various junior colleges of the capability of the junior college transfer student information system and requests are made for data which go beyond that presented in the published and circulated reports. Too, administrators on this campus now expect and anticipate the reports which relay more current data. Academic deans and other program planners seek information from the file as they develop or alter academic offerings.

The system, once operational, is easily and inexpensively maintained and produces an abundance of information for a wide assortment of institutional planning and management functions.

Figure 4

RATE OF TRANSFER

JC	1969—1970				1970—1971				1971—1972				1972—1973			
	SU	F	W	SP	SU	F	W	SP	SU	F	W	SP	SU	F	W	SP
01	18	54	19	21	18	33	13	5	12	44	32	18	15	62	23	19
02	1	18	3	4	2	14	4	2	6	20	8	2	4	21	6	3
03	6	14	0	3	2	11	0	2	4	17	2	2	4	17	9	4
04	7	30	3	4	1	27	2	9	4	31	5	7	4	36	9	7
05	6	61	10	8	8	33	13	7	11	64	11	9	1	49	15	12
06	6	30	5	3	6	34	12	4	3	27	3	3	4	29	8	5
07	8	17	1	3	5	10	5	2	1	17	2	4	1	28	5	0
08	3	10	0	2	1	11	0	0	5	12	1	0	1	17	2	3
09	7	17	4	4	2	14	3	2	1	8	5	3	3	15	6	1
10	9	46	11	19	15	44	14	8	12	48	19	12	14	54	21	31
11	2	20	3	6	3	8	2	2	6	31	8	8	4	27	10	8
12	3	10	0	1	2	7	2	3	0	24	3	4	3	14	3	0
13	6	23	6	13	4	26	7	6	4	21	8	5	10	23	3	7
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	1	2	6	1	0	1	7	3	0
17	0	0	0	0	0	0	0	0	0	3	2	2	0	4	1	1
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
QTR. TOTAL	83	350	65	91	69	272	77	53	71	373	110	79	69	403	124	102
ANNUAL TOTALS		00589				00471				00633				00698		

JC	1973—1974				1974—1975				1975—1976				1976—1977			
	SU	F	W	SP	SU	F	W	SP	SU	F	W	SP	SU	F	W	SP
01	18	47	19	9	13	68	0	0	0	0	0	0	0	0	0	0
02	4	37	9	4	8	23	0	0	0	0	0	0	0	0	0	0
03	4	17	4	1	4	16	0	0	0	0	0	0	0	0	0	0
04	9	38	5	2	6	53	0	0	0	0	0	0	0	0	0	0
05	8	66	15	10	5	52	0	0	0	0	0	0	0	0	0	0
06	4	35	4	7	5	18	0	0	0	0	0	0	0	0	0	0
07	2	17	2	1	4	18	0	0	0	0	0	0	0	0	0	0
08	1	8	5	1	8	9	0	0	0	0	0	0	0	0	0	0
09	2	10	1	0	1	15	0	0	0	0	0	0	0	0	0	0
10	9	69	24	14	14	48	0	0	0	0	0	0	0	0	0	0
11	7	39	9	9	4	34	0	0	0	0	0	0	0	0	0	0
12	2	15	2	4	5	26	0	0	0	0	0	0	0	0	0	0
13	3	37	9	5	7	38	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
15	0	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0
16	0	8	1	3	3	20	0	0	0	0	0	0	0	0	0	0
17	2	6	3	1	0	3	0	0	0	0	0	0	0	0	0	0
18	1	0	0	2	0	3	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0
QTR. TOTAL	76	451	112	73	88	446	0	0	0	0	0	0	0	0	0	0
ANNUAL TOTALS		00712				00534				00000				00000		

Figure 5
PROGRAM SELECTION OF TRANSFERS

	PHARMACY		AGRICULTURE		ARCHITECTURE		INTERDEPT		EDUCATION		ENGINEERING	
01	19	2.6	57	7.8	26	3.5	0	.0	242	32.9	102	13.9
02	10	4.1	17	7.1	13	5.4	1	.4	65	27.0	32	13.3
03	2	1.0	20	10.5	6	3.1	0	.0	67	35.1	31	16.2
04	9	2.5	19	5.2	17	4.6	0	.0	92	25.1	65	17.7
05	29	5.2	41	7.3	41	7.3	1	.2	128	22.7	141	25.0
06	11	3.2	23	6.7	23	6.7	0	.0	77	22.4	60	17.5
07	6	3.1	21	10.8	6	3.1	0	.0	57	29.4	29	14.9
08	5	4.3	20	17.2	2	1.7	0	.0	48	41.4	7	6.0
09	5	3.2	21	13.5	5	3.2	0	.0	46	29.7	11	7.1
10	4	.6	28	4.0	22	3.2	1	.1	318	45.9	51	7.4
11	4	1.3	22	7.2	20	6.6	0	.0	77	25.2	45	14.8
12	3	1.7	22	12.5	10	5.7	0	.0	60	34.1	15	8.5
13	8	2.5	25	7.7	12	3.7	0	.0	104	32.2	35	10.8
14	1	50.0	0	.0	0	.0	0	.0	0	.0	0	.0
15	0	.0	0	.0	0	.0	0	.0	2	50.0	1	25.0
16	0	.0	10	17.9	3	5.4	0	.0	14	25.0	3	5.4
17	0	.0	6	21.4	1	3.6	0	.0	9	32.1	4	14.3
18	0	.0	0	.0	1	14.3	0	.0	1	14,3	2	28,6
19	0	.0	0	.0	0	.0	0	0	2	100.0	0	.0
TOTAL	116	2.5	352	7.8	208	4.6	3	.0	1409	31.3	634	14.0

	HOME EC		ARTS SCI		VET MED		SPARE		BUSINESS		TOTALS	
01	25	3.4	122	16.6	0	.0	0	.0	142	19.3	735	16.3
02	8	3.3	57	23.7	0	.0	0	.0	38	15.8	241	5.4
03	10	5.2	31	16.2	0	.0	0	.0	24	12.6	191	4.2
04	31	8.4	86	23.4	0	.0	0	.0	48	13.1	367	8.2
05	28	5.0	95	16.9	0	.0	0	.0	59	10.5	563	12.5
06	11	3.2	85	24.8	0	.0	0	.0	53	15.5	343	7.6
07	10	5.2	47	24.2	0	.0	0	.0	18	9.3	194	4.3
08	2	1.7	20	17.2	0	.0	0	.0	12	10.3	116	2.6
09	6	3.9	38	24.5	0	.0	0	.0	23	14.8	155	3.4
10	20	2.9	93	13.4	0	.0	0	.0	165	22.5	693	15.4
11	18	5.9	69	22.6	0	.0	0	.0	50	16.4	305	6.8
12	7	4.0	30	17.0	0	.0	0	.0	29	16.5	176	3.9
13	24	7.4	69	21.4	0	.0	0	.0	46	14.2	323	7.2
14	0	.0	1	50.0	0	.0	0	.0	0	.0	2	.0
15	0	.0	1	25.0	0	.0	0	.0	0	.0	4	.1
16	4	7.1	15	26.8	0	.0	0	.0	7	12.5	56	1.2
17	1	3.6	4	14.3	0	.0	0	.0	3	10.7	28	.6
18	0	.0	3	42.9	0	.0	0	.0	0	.0	7	.2
19	0	.0	0	.0	0	.0	0	.0	0	.0	2	.0
TOTAL	205	4.5	866	19.2	0	.0	0	.0	708	15.7	4501	100.00

Figure 6
ENROLLMENT STATUS OF TRANSFERS BY ACADEMIC SCHOOLS

SCHOOL OF ENGINEERING

	PHARMACY			AGRICULTURE			ARCHITECTURE			INTERDEPT			EDUCATION			ENGINEERING		
	G	DO	CE	G	DO	CE	G	DO	CE	G	DO	CE	G	DO	CE	G	DO	CE
65-66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
66-67	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	2	0
67-68	0	0	0	3	0	0	4	0	0	0	0	0	1	0	0	48	20	0
68-69	1	0	0	1	1	0	1	0	0	0	0	0	0	0	0	49	17	0
69-70	0	0	0	1	1	0	1	0	0	0	0	0	3	0	0	62	24	0
70-71	0	0	0	1	1	0	0	1	0	0	0	0	1	2	0	27	21	0
71-72	0	0	0	0	1	0	0	2	0	0	0	0	1	0	0	37	29	0
72-73	0	0	0	0	2	0	0	1	0	0	0	0	0	0	0	7	66	0
73-74	0	0	0	0	2	0	0	1	0	0	0	0	0	1	0	0	65	0
74-75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53	0
SUMS	1	0	0	6	8	0	6	5	0	0	0	0	6	3	0	235	298	0

	HOME ECONOMICS			ART & SCIENCE			VET MEDICINE			SPARE			BUSINESS			SCH ENTERED		
	G	DO	CE	G	DO	CE	G	DO	CE	G	DO	CE	G	DO	CE	G	DO	CE
65-66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
66-67	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	6	3	0
67-68	0	0	0	1	1	0	0	0	0	0	0	0	9	1	0	66	22	0
68-69	0	0	0	3	0	0	0	0	0	0	0	0	8	1	0	63	19	0
69-70	0	0	0	2	4	0	0	0	0	0	0	0	5	2	0	74	31	0
70-71	0	0	0	3	1	0	0	0	0	0	0	0	1	4	0	33	30	0
71-72	0	0	0	1	3	0	0	0	0	0	0	0	2	2	0	41	37	0
72-73	0	0	0	1	0	0	0	0	0	0	0	0	0	4	0	8	73	0
73-74	0	0	0	0	2	0	0	0	0	0	0	0	0	3	0	0	74	0
74-75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53	0
SUMS	0	0	0	12	11	0	0	0	0	0	0	0	25	18	0	291	343	0

SCHOOL OF HOME ECONOMICS

	PHARMACY			AGRICULTURE			ARCHITECTURE			INTERDEPT			EDUCATION			ENGINEERING		
	G	DO	CE	G	DO	CE	G	DO	CE	G	DO	CE	G	DO	CE	G	DO	CE
65-66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

G — Graduated
DO — Dropout
CE — Currently Enrolled

Figure 7
PRE- AND POST-TRANSFER ACADEMIC PERFORMANCE

Junior College 06

	JUNIOR COLLEGE PERFORMANCE								AUBURN PERFORMANCE							
	NO TRAN	QTRS	HRS	HPTS	GPA	M-QTRS		M-HRS	AVG-HR	CUM-HR	T-HRS	H-PTS	GPAAVG1-HRS		1-HPTS	1-GPA
65-66	0.0	0	0	0	0.00	0.0	0	0.00	0.0	0	0	0	0.00	0.0	0	0.00
66-67	8.0	26	433	650	1.50	3.2	0	54.12	158.0	1249	1264	1639	1.31	15.7	101	0.80
67-68	50.0	256	4171	6800	1.63	5.1	0	83.42	119.1	5824	5959	7862	1.34	15.4	885	1.14
68-69	30.0	168	2540	4138	1.62	5.6	0	84.66	124.3	3627	3729	6312	1.74	16.2	685	1.40
69-70	44.0	277	4282	6425	1.50	6.2	0	97.31	124.5	5356	5478	7761	1.44	15.1	848	1.26
70-71	56.0	350	5150	8219	1.59	6.2	0	91.96	108.1	5911	6058	8915	1.50	14.7	1040	1.26
71-72	36.0	195	2782	4334	1.55	5.4	0	77.27	109.5	3869	3945	5410	1.39	14.8	579	1.08
72-73	46.0	299	3994	6538	1.63	6.5	0	86.82	81.7	3706	3761	5082	1.37	15.4	736	1.03
73-74	50.0	274	3624	5913	1.63	5.4	0	72.48	42.0	2088	2102	2806	1.34	14.4	962	1.33
74-75	23.0	120	1494	2357	1.57	5.2	0	64.95	2.5	58	58	107	1.84	13.6	370	1.17
SUMS	343.0	1965	28470	45374	1.59	5.7	0	83.00	94.3	31688	32354	45894	1.44	15.0	6206	1.20
GRADUATED																
65-66	0.0	0	0	0	0.00	0.0	0	0.00	0.0	0	0	0	0.00	0.0	0	0.00
66-67	7.0	24	401	611	1.52	3.4	0	57.28	171.7	1187	1202	1600	1.34	15.7	95	0.86
67-68	36.0	191	3084	4936	1.60	5.3	0	85.66	142.6	5014	5134	7018	1.39	15.7	694	1.22
68-69	22.0	128	1916	3256	1.69	5.8	0	87.09	142.3	3032	3131	5711	1.88	16.1	560	1.57
69-70	33.0	210	3240	4809	1.48	6.3	0	98.18	135.6	4353	4475	6457	1.48	15.2	698	1.38
70-71	34.0	213	3119	5312	1.70	6.2	0	91.73	135.8	4474	4620	7394	1.65	15.3	782	1.49
71-72	18.0	102	1499	2449	1.63	5.6	0	83.27	139.3	2439	2508	3750	1.53	16.0	373	1.29
72-73	6.0	38	591	1133	1.91	6.3	0	98.50	124.1	703	745	1204	1.71	16.0	139	1.44
73-74	0.0	0	0	0	0.00	0.0	0	0.00	0.0	0	0	0	0.00	0.0	0	0.00
74-75	0.0	0	0	0	0.00	0.0	0	0.00	0.0	0	0	0	0.00	0.0	0	0.00
SUMS	156.0	906	13850	22506	1.62	5.8	0	88.78	139.8	21202	21815	33134	1.56	15.6	3341	1.36
DROPPED OUT																
65-66	0.0	0	0	0	0.00	0.0	0	0.00	0.0	0	0	0	0.00	0.0	0	0.00
66-67	1.0	2	[illegible]	39	1.21	2.0	0	32.00	62.0	62	62	39	0.62	16.0	6	0.37
67-68	13.0	58	967	1678	1.73	4.4	0	74.38	52.0	662	677	648	0.97	14.5	187	0.98
68-69	7.0	37	574	804	1.40	5.2	0	82.00	70.5	491	494	423	0.86	16.1	84	0.74
69-70	8.0	49	747	1083	1.44	6.1	0	93.37	66.2	530	530	417	0.78	14.5	88	0.75
70-71	19.0	117	1735	2449	1.41	6.1	0	91.31	57.0	1083	1083	1115	1.02	13.3	214	0.84
71-72	11.0	56	716	1068	1.49	5.0	0	65.09	45.2	497	498	383	0.77	12.7	73	0.52
72-73	12.0	71	853	1206	1.41	5.9	0	71.08	39.9	479	479	279	0.58	15.0	115	0.63
73-74	12.0	58	774	1159	1.49	4.8	0	64.50	27.5	331	331	290	0.87	13.4	192	1.19
74-75	0.0	0	0	0	0.00	0.0	0	0.00	0.0	0	0	0	0.00	0.0	0	0.00
SUMS	83.0	448	6398	9486	1.48	5.3	0	77.08	50.0	4135	4154	3594	0.86	14.0	959	0.82
CURRENTLY ENROLLED																
65-66	0.0	0	0	0	0.00	0.0	0	0.00	0.0	0	0	0	0.00	0.0	0	0.00
66-67	0.0	0	0	0	0.00	0.0	0	0.00	0.0	0	0	0	0.00	0.0	0	0.00
67-68	1.0	7	120	186	1.55	7.0	0	120.00	148.0	148	148	196	1.32	15.0	4	0.26
68-69	1.0	3	50	78	1.56	3.0	0	50.00	104.0	104	104	178	1.71	18.0	41	2.27
69-70	3.0	18	295	533	1.80	6.0	0	98.33	157.6	473	473	887	1.87	16.3	62	1.26
70-71	3.0	20	296	458	1.54	6.6	0	98.66	118.3	354	355	406	1.14	16.6	44	0.88
71-72	7.0	37	567	817	1.44	5.2	0	81.00	134.1	933	939	1277	1.36	14.8	133	1.27
72-73	28.0	190	2550	4199	1.64	6.7	0	91.07	90.6	2524	2537	3599	1.42	15.5	482	1.10
73-74	38.0	216	2850	4754	1.66	5.6	0	75.00	46.6	1757	1771	2516	1.43	14.7	770	1.37
74-75	23.0	120	1494	2357	1.57	5.2	0	64.95	2.5	58	58	107	1.84	13.6	370	1.17
SUMS	104.0	611	8222	13382	1.62	5.8	0	79.05	61.3	6351	6385	9166	1.44	14.8	1906	1.23

Figure 8
GRADE DISTRIBUTIONS IN SELECTED ACADEMIC PROGRAMS

SELECTED TOTAL GRADES FA73

JC 009	A	B	C	D	F	S	DEF	AUD	WITHDRAWN	TOTALS FOR COURSES
EH 262			1							1
TOTALS FOR GRADES			1							1

SELECTED TOTAL GRADES FA73

JC 010	A	B	C	D	F	S	DEF	AUD	WITHDRAWN	TOTALS FOR COURSES
EH 459			1							1
TOTALS FOR GRADES			1							1

SELECTED TOTAL GRADES FA73

JC 011	A	B	C	D	F	S	DEF	AUD	WITHDRAWN	TOTALS FOR COURSES
EH 254			1							1
EH 260		1								1
EH 357				1						1
EH 452		1								1
TOTALS FOR GRADES		2	1	1						4

SELECTED TOTAL GRADES FA73

JC 013	A	B	C	D	F	S	DEF	AUD	WITHDRAWN	TOTALS FOR COURSES
EH 103		1								1
EH 352									1	1
TOTALS FOR GRADES		1							1	2

SELECTED TOTAL GRADES FA73

JC 017	A	B	C	D	F	S	DEF	AUD	WITHDRAWN	TOTALS FOR COURSES
EH 101				1						1
EH 304		1								1
TOTALS FOR GRADES		1		1						2

STUDENT FLOW AT THE COMMUNITY COLLEGE

Paul G. Larkin, Prince George's Community College

The way the students flow through the community college once they have enrolled is important for planning, but has been given inadequate attention by researchers. It is known, for example, that most persons getting the bachelor's degree now take over four years to do it. What are the facts for the community college, often referred to as the "two-year" college? If the student gets an associate degree, does he do it in two years? Does he actually enroll for 15 credit hours for 4 consecutive fall and spring semesters? Or do many students drop in and stop out, moving toward some personal goal (such as transfer, graduation, career opportunity, or promotion)?

The outcomes of college are also important for understanding student flow. Do students seek degrees in career programs, for example, in order to get a job? Or do they already have that job before they graduate? How many students transfer successfully to a four-year college without the A.A. degree? How do graduations affect student flow? Questions like these emphasize the need for a student flow model. This report analyzes available data and recent research results in such a way as to show how students move through the community college.

There has been some research comment on the way students stop in and stop out of community college flow, using the community college to achieve a variety of goals. One study followed up and reported on nearly 1,000 community college alumni in Florida and concluded that only 2% could be called "dropouts." Previous research had suggested a dropout rate more nearly like 50% referring to persons who did not get a degree. The Florida study, reported by Dr. James Wattenbarger, redefined dropout to mean students who had neither achieved their original goals nor changed their plans within three years.

Method of Study

Several sources of information were used to develop a picture of student flow. Routine records of Prince George's Community College (PGCC) were available to trace sources of students, freshman and sophomore flows, and graduation patterns on a five-year basis. A special study of the class of 1970 was also undertaken to assess the "in and out" patterns of attendance, if any. And finally, a Spring 1974 survey indicated some of the educational outcomes for students entering in 1970.

The "A.A. Degree" Model

As a first approximation for understanding student flow, it is useful to describe student flow in terms of progress toward graduation. This general model fails to take into account other educational outcomes besides degrees, but has the advantage of being comparable with a more traditional point of view concerning college attendance and the degree. According to the traditional college model represented by the Ivy League of the 1930s, one may imagine a "typical" or "desirable" pattern whereby a student enrolls for four consecutive years and gets the B.A. Research has demonstrated that this college model no longer realistically describes what people actually do. Most who achieve a B.A. take more than four years to do so. Moreover, many go to college today for other purposes besides a degree, especially the community college. But if we understand the "degree-oriented" model, we can understand those who are not getting the degree in context. We may then raise questions about ways and means to help students achieve their goals, whatever those goals are, including the degree if that is what they want.

There is a way of organizing credentials and experience to capitalize on job opportunity. Insofar as the credit hour represents a certification of self-confidence and a particular set of behavioral skills, there is a way of accumulating credit hours to serve career as well as transfer goals. It is the career component which is showing strongest growth today.

Whether from the point of view of the transfer or the career student, however, there is a logical flow of students from local high schools through community college graduation. Many students follow this path every year. In terms of the "pipeline" of flow, most of the student body at PGCC since Fall 1969 have been "freshmen" (students with less than 28 credit hours). The "sophomore" is by definition a student on the second half of the way toward a degree, which currently requires about 60 credits. Sophomores are the pool from which graduates flow.

Five steps can describe student flow in the A.A. degree model: high school graduation, college matriculation, freshman status, sophomore status, and then graduation. In the past five years, PGCC graduations increased faster (167%) than the number of sophomores (118%). Freshmen increased faster than matriculations from high school (6%). The implications may not be what they would appear to be at first glance, however, because there are other sources of community college students besides students straight out of high school. (Tabular data and full report available on request.)

The County high schools, one principal origin of students, had only a 14% growth in diplomas in the past 5 years. If students came to the community college only straight out of high school, and left two years later, Prince George's Community College would not be growing. The fact is that students are coming more and staying longer, as the PGCC Model will show.

There is a way of checking the student flow model by comparing the expectations suggested by the five-year data with actual data. The flow in the 1969-1973 period would lead to the anticipation that there would be about 1000 graduates in 1974-75. There would also be perhaps 2,200 sophomores and 7,500 freshmen in Fall, 1974. Approximately 1,400 of these freshmen would be regular students direct from high school. This was validated in Fall, 1974.

Sources of New and Returning Students

The number of first-time collegians attending PGCC increased by 1,000 in the 1969-1973 period. In the same five years, the number of students continuing college work increased by about 3,000. Thus the "returning student" in the broadest sense of the term was increasing in the pipeline in approximately three times the numbers of the persons new to college study. This suggests that students are staying longer. Thus, regular students from the previous term are the major source of all students continuing in college. Transfers from other colleges and readmits follow next as sources of students continuing college. Special students are a negligible source. (The special student is usually thought of as one who has not yet elected a "regular" curriculum or major field.)

The expectation of the model based on 1969-1973 data is that 6,500 or 7,000 students continuing college work would be the main component of the Fall 1974 enrollments. Between 3,000 and 3,500 first-time students would also enroll. Observed data for 1974 indicate that these expectations would be well-founded, although first-time students would be at the lower end of the range of expectations.

Following The Same Students as They Flow: The Class of 1970

Comparing freshmen, sophomores, and the like from one Fall Term to the next gives one picture of student flow. Regardless of whether they are the same individuals or not, the count of freshmen reveals something about how students are doing in the pipeline. It is as though a snapshot were available each year to show the state of the College, but this snapshot by its very nature permits only a glimpse at the pipeline at a point in time. Another approach is possible, whereby the same students are picked up at a given point in time, and are then followed as they flow through the pipeline for a number of years. For the purpose of developing this aspect of the Community College Model, research was undertaken concerning 2,416 students entering Prince George's Community College at the beginning of the 1970-71 academic year. Their records were traced in terms of attendance patterns of each individual student for the successive Spring, Fall, and Summer terms up to the Spring term of 1974. The paragraphs which follow document the results of this research.

How Students Stopped Out or Continued After Fall 1970

As noted earlier, there was some research opinion than an "in and out" pattern of attendance characterized the way many students were using the community college. In order to check this view, it was decided to review hard data on file at Prince George's Community College. The question was this: based on records of students entering in 1970, precisely what were the observable patterns of dropping in and dropping out or stopping in and stopping out over a period of three years? This was the same time frame used in the Florida research study reported by Wattenberger. As shown in the accompanying Table 1, 26% attended only once. Of the remainder three out of four continued straight through for one to six semesters, most of them for a total of either two or four semesters. Only 445 of the original 2,416 were "in and out."

Table I

SUMMARY TABLE SHOWING ATTENDANCE PATTERNS OF 2,416 STUDENTS ENTERING IN SUMMER/FALL OF 1970

	Category	*Number*	*%*
1.	One-time attenders	633	26%
2.	Attending beyond Fall 1970	1,749	72%
	a. Straight thru	(1,271)	(54%)
	b. In-and-out	(445)	(18%)
3.	Status unknown	34	1

% Does not add to 100% due to rounding

Most students who were "in-and-outs" during the period under study interrupted their studies for only a single spring or fall semester. It was found that 266 of the 455 "stop-outs" (60%) were out for only one major semester before returning again. Another 95 students were out for two semesters (cumulative percentage of stop-out for either one or two semesters, 81%). It appears that the longer a student stays out, the less likely it is he will return at least in the short run (three years). Shorter-term constraints on alternatives for behavior forbid too much generalizing on this observation. Further research is needed, including investigation of collateral evidence at other community colleges besides Prince George's.

A difference with respect to the Florida research is that here the observations are recorded student behaviors. In the Florida study, the expressed intentions of the former students were an important part of the evidence used. Whether the former PGCC students had similar intentions that would later be translated into action is an open question.

Community College Outcomes; Graduations and Transfers

A follow-up study of students entering Prince George's Community College in 1970 was conducted in the Spring of 1974. Special analyses were made of 69 graduates and 67 "quasi-graduates" (students who had accumulated 58 or more credits) who responded. The results of this study are reported in greater detail elsewhere, but the findings of this survey suggest that there may be as many persons transferring without graduation as there are students graduating.

The question of transfer as an outcome comparable with graduation is an important one. Students can transfer without the home college knowing about it. A recent development in Maryland is an attempt to have all public colleges and the university system notify each other of within-state transfers. This information sharing is just being developed as Maryland's transfer patterns are changing. Meanwhile, the problem remains: How can institutions keep track of successful transfers outside the state?

Graduates, Transfers, and Dropouts: Discussion of Implications

When the College loses students from their regular flow through the pipeline, they may not return. Colleges should, as a matter of service, maximize incentives for students to continue college work without interruption, until they graduate, transfer, achieve career goals, or inevitably discover that continuing college work is not for them. Survey evidence indicates that the students appreciate the quality of instruction and faculty services. The question can then be asked, what incentives and encouragements are being used or devised to keep students moving toward degree, transfer, or job, until the student himself decides he has had enough? Could we think the unthinkable, and charge students less tuition as they near the degree? (And dispense with graduation fees?) Since returning students are prime sources of growth and service, they deserve some kind of special attention.

What provisions are being made for recognizing and rewarding students in sophomore status? Is there any advantage given to students returning each fall after being registered in the spring? How can "continuing" behavior be reinforced, or at least not ignored? What are the obstacles for students who would like to continue, but can't? There are obstacles the College can't do anything about. But what obstacles can the College do something about? Questions like these are challenges for further research, planning, and service.

Other Variables

The foregoing is not the whole story. Much additional information is known that permits insights into how students flow through Prince George's Community College. Recent studies have documented multi-year trends in the enrollments of women, blacks, older students, career-oriented students, and part-time students. More needs to be known on a longitudinal basis about how these variables interact. This will permit the College to be appropriately responsive to the changing characteristics and needs of its students.

The Student Flow Process

The word model can mean a plan or an exemplary standard. In this report, the term refers to a mathematical model: a set of data showing relationships that change in response to internal decisions and outside forces. Mathematical models are used increasingly in planning and budgeting applications. They show how changes in inputs, process, and outcomes influence each other. This makes contingency planning possible. What will the future be like if circumstances are the same, or if they change? Models suggest answers.

The present model uses selected trends in student origins, student flow, and educational outcomes at Prince George's Community College to get an understanding of how students are using the College. Such understanding makes policy alternatives clearer. Consequences of new programs for student flow, for example, become visible in terms of freshmen and sophomore enrollments, graduations, transfers, and other outcomes. Thus the model becomes useful for educational program evaluation and further planning in terms of the College's mission and objectives. Further studies are currently under way to apply this model to specific curricula, such as nursing.

PREDICTING STUDENT ATTRITION

Harry J. Knopke, University of Wisconsin-Madison

Two longitudinal studies of student attrition at the University of Wisconsin-Madison School of Nursing were initiated as part of the school's evaluation of its new baccalaureate curriculum. One of the studies examined recent historical enrollment data to identify rates of attrition, general causes for attrition, and points in the educational program where attrition most frequently occurred. The other study, derived from the first, sought to develop a statistical prediction model with which potentially successful and non-successful students could be identified at an acceptable level of accuracy. From both studies procedures were established for continued monitoring of students as they progress through the four years of the educational program.

Program and Student Characteristics

The traditional open door admissions policy of the university provided that any student meeting minimum university requirements and specifying Nursing as a major was to be admitted to the School of Nursing. Thus, widely heterogeneous classes of students were placed in a structured, science-oriented environment wherein clinical nursing experiences did not begin until the junior year.

To prepare nurses for varying professional roles to meet the new demands for health care and to attend to the diversity of students entering the school, a new educational program was designed and implemented. Intended to individualize instruction for students, it offered variegated experiences and opportunities for learners of different types, and began nursing content and some clinical experience in the freshman year. It was felt such an individualized approach, integrating students into the profession at an early stage, would contribute to maximal usage of resources and talents.

Successful students in the new program were initially hypothesized to be independent, flexible learners, able to evaluate their own abilities and progress, and able to work with different people in different settings. Since no objective measures of these traits had been available with university admissions data, it was decided to follow students through the program by periodic administering of several data gathering instruments. Among these was the Edwards Personality Preference Schedule (Edwards, 1959); it was used to determine whether students displaying discernible learning strengths or weaknesses indicate personality needs that differ from other students. Another was the Nursing Student Self-Disclosure Inventory (Stone, 1971), an instrument developed to obtain student descriptions of themselves as learners. Student responses to these and other instruments served as planning tools for faculty, as well as indicators of the effectiveness of the new program.

Identified Trends in Attrition

In part to assess the effectiveness of the new program after three years of implementation, and in part to establish baseline data for longitudinal monitoring of student attrition, a study of six years of enrollment data was undertaken. Students in the school during the three years prior to implementation of the new curriculum were studied, as were students in the school for the three years since implementation. By concentrating on these six years it was felt a representative description of attrition before and after the curriculum change could be obtained. Further, any relationship of attrition to the concurrent enrollment growth experienced by the school could also be demonstrated.

Students who withdrew from the School of Nursing but who remained at the University of Wisconsin-Madison and students who withdrew from both the school and the campus were identified by semester by enrollment year. The resultant trends in attrition describing both groups of students are synthesized as follows:

1. Over the six years studied the average yearly student attrition in the School of Nursing had been 19% of the total enrollment. There was very slight variance in this percentage figure for each of the six years, indicating the rate of attrition paralleled the rate of enrollment growth. (In 1968-69 the total undergraduate enrollment was 571; in 1973-74 it was 1,173).
2. By far the largest percentage of student withdrawals occurred between students' sophomore and junior years (18% average attrition at this point over the 6 years), and between students' junior and senior years (19% average attrition over the 6 years). Thus, the second semester sophomores and second semester juniors comprised the class populations suffering the largest attrition rates
3. When considered by semesters over the 6 years, an average of 7% of the attrition occurred in the first semesters, while an average of 13% of the attrition occurred during or after the second semester.
4. The major reasons given by students leaving the school's educational program were changes in career plans, difficulties with one or more courses in the basic science component, perceived inability to work with sick people, and difficulties experienced in adjusting to the school and/or the campus.
5. Failing to maintain an adequate grade point level and, thus, becoming ineligible to continue in the school's educational program also characterized a significant percentage of students leaving the school.

These trends and characteristics of recent attrition having been identified, it was then undertaken to establish their relationship to the new educational program and to determine their potential impact on its continued implementation.

Attrition Prediction

The ability to predict student attrition was seen as a tool to be used by faculty, counselors, and administrators in planning for and carrying out learning activities that match the individual learning needs and interests of students with appropriate resources. The need for an ability to predict student attrition was further dictated by the imposition of enrollment levels on university schools and departments as a result of increased budgetary restrictions. Thus, it was felt that identification of potentially unsuccessful students, if made early enough, would increase the effectiveness of necessary counseling, remedial work, or tutoring.

Research in higher education has indicated high school G.P.A. and high school percentile rank have been consistent predictors of student success in undergraduate programs (Astin, 1972). Further, first semester undergraduate G.P.A. has also been shown to be an accurate predictor of success or non-success in subsequent undergraduate work because it reflects similarities in educational environment and performance measures (Owen & Feldhusen, 1970).

Studies of successful and non-successful students have employed such achievement measures, but have also incorporated personality, attitudinal, and social-psychological measures in their analyses. Rose and Elton (1966) found that personality characteristics significantly differentiated between types of persistence and withdrawal, and between withdrawing and persisting students. Starr, Betz, and Menne (1972) reported that overall satisfaction with the college environment was inversely related to whether or not students remained in the environment. Spady (1971) suggested that attitudes toward learning may be more important than the quantity and quality of previous academic-intellectual experience.

The need to consider the variety of available student data in examining successful and non-successful students was summarized by Tinto and Cullen (1973), who maintained "... dropout is a multidimensional process which results from the interaction between the individual and the institution and which is influenced by the characteristics of both elements" (p. 41). To develop a means for predicting attrition in the School of Nursing, then, it was decided to employ those available measures that related to the interaction of students and program. Use of data appropriate to the nature of the school and its students could, thus, be expected to provide an indication of students' probable performance in the educational program of the school.

Development of the Prediction Model

To develop a prediction model that would identify students as potentially successful or unsuccessful in the School of Nursing, the discriminant analysis technique was employed. Discriminant analysis is a form of multiple regression where the criterion variable is group membership and the independent variables are used to predict the group to which each individual probably belongs. Further, the contribution (weight) each independent variable makes to this prediction is specified, thus demonstrating the interrelationships between variables.

Use of this technique with available nursing student data was intended to obtain maximal discrimination between two groups of students, dropout and continuing, from the first three years of the new program. The following student measures were used as the independent variables to predict group membership:

1) first semester G.P.A.;
2) high school percentile rank in class;
3) the College Qualification Test (CQT) "Science" sub-part;
4) the learning style score (a numerical index representing a continuum of learning preferences from other-directed to self-directed) obtained by the Nursing Self-Disclosure Inventory;
5) the following personality need variables from the Edwards Personal Preference Schedule that had already demonstrated some relationships to the learning processes of nursing students in the new program: achievement, order, autonomy, succorance, dominance, change, endurance, and aggression.

Data from a random sample of 63 students identified as having left the school in the 3-year period under study and a random sample of 173 active students from the same time period was used as a basis for the initial discriminant analysis.

Results of the analysis indicated the combined discriminatory power of the independent variables employed was highly significant (F = 5.38, df = 12/223). The chi-square test computed for the obtained discriminant function indicated this function provided discrimination significant beyond the .000 level of significance (chi-square = 58.25, df = 12).

Descriptive statistics associated with each of the independent variables are presented in Table 1. Column 1 presents the mean scores on each independent variable of those students identified as dropouts; Column 2 presents the mean scores on the same variables for the continuing students group; and Column 3 gives the significance level of the F-ratio calculated for the differences between the mean scores of each group.

Individual predictor variables significantly contributing to the differentiation of the two groups of students are noted in the table by asterisks. As suggested in the research and literature of higher education, first semester G.P.A. and high school percentile rank were significant predictors of group membership, representing both previous academic performance and achievement in the university environment. The CQT "Science" score was found to contribute significantly to predicting group membership. Including content from physics,

Table I

MEAN SCORES ON PREDICTOR VARIABLES OF DROPOUT AND CONTINUING STUDENTS

	1	2	3
Predictor Variable	Dropout group mean scores	Active group mean scores	P ≤
First Semester GPA	2.1168	2.8130	.0000*
HS Percentile Rank	74.9032	82.9711	.0005*
CQT Science	33.0794	40.0462	.0456
Learning Style	42.7143	43.5491	.6527
Achievement	12.3016	12.2717	.9570
Order	11.0635	9.7688	.0501*
Autonomy	11.7143	12.2832	.6766
Succorance	12.9683	13.3468	.5624
Dominance	10.9524	12.4393	.0186*
Change	17.3810	17.2659	.8701
Endurance	13.5238	13.1850	.6505
Aggression	9.8889	11.3526	.0293*

chemistry, and biology, this score provides an indication of the nature of a student's understanding of scientific knowledge and principles. The development of such an understanding is essential for progress in nursing. The three significant personality variables—order, dominance, and aggression—depicted students in the dropout group as expressing a greater need for structure and organization than those in the continuing group, while also expressing a lesser need for leadership and self-assertion. Such characteristics have not been associated with the independent, flexible learners likely to be successful in the school's new program.

Examination of the scores of individual students revealed overlapping high and low scores on each variable for students in the two identified groups. It was, thus, concluded scores on individual variables would not provide an accurate forecast of a student's probable performance in the educational program. Rather, it was decided the interrelationships among variables should be considered in order to forecast the probable success or non-success of students.

Predicting Attrition

To apply the results of the discriminant analysis to predict student attrition, the scores of each student on each variable were multiplied by the appropriate discriminant weight that was generated in computing group discrimination. These products were summed to form a discriminant score for comparison with the average discriminant scores of the dropout and continuing students groups. The average discriminant scores represent the point on a continuum about which the scores of the members of each group should cluster.

Using a midpoint between these average discriminant scores as an arbitrary cutoff point, discriminant scores of all students enrolled in the school during the three year period considered, for whom all data was available, were examined to determine group membership. While use of the midpoint as a cutoff will necessarily misplace some students, 68% were correctly identified as dropouts and 76% were correctly identified as continuing in the program.

Discriminant scores were computed in similar fashion for the current class of freshmen nursing students: 27% were identified as potential dropouts, while 73% were identified as potentially successful students in the program. Of the 16 freshmen students who withdrew from school at the end of the first semester, 10 had been correctly identified as dropouts by this technique.

Significance of the Procedure

To date there has been little research conducted in higher education attempting to predict the probable attrition of students in undergraduate programs. Many discussions of the characteristics of probable dropouts represent post hoc descriptions of successful students; those students with achievement or aptitude scores that are relatively lower than those associated with successful students have been inferred to be probable dropouts. While reference to established performance measures contributes to an understanding of students, their interpretation would be enhanced when considered with other measures to reflect the interactions of students and the institution.

The major significance of this research derives from its use of data reflecting the interaction of students and institution as defined by the assumptions and objectives of a particular school. The resultant discrimination between dropout and continuing students was based on a combination of variables defined as meaningful to the educational program of the School of Nursing. Thus, the ensuing prediction capabilities were related to the intent and objectives of that school. Such utilization of data is possible for any college, school, or department specifying the objectives and purposes of its educational program.

Budget restrictions are increasingly becoming commonplace in higher education, as is the desire of students to spend their education dollars wisely. Any reliable procedures or techniques contributing to the better utilization of talents and resources should thus be welcomed. The procedures described for predicting attrition can be used to further assist faculty in planning their instructional programs; they can be used by administrators in their institutional planning; and they can be used by counselors or advisors in assisting students in program development, selection of remedial or tutorial opportunities, or reexamination of career choice.

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THE STUDY OF GRADUATES OF POSTSECONDARY INSTITUTIONS: A SEARCH FOR THE PRODUCTS OF HIGHER EDUCATION

Ralph E. Henard, The University of Colorado at Denver

More rigorous demands for the justification of budget requests and public reservations about the value of higher education have created pressures on institutions to discover more about their products. The study of graduates of postsecondary institutions can assist in this search. A product is a result or an outcome. In one sense, the products of higher education are the graduates. More specifically, the outcomes are the benefits produced for individual graduates and that which, in turn, is produced by them. These benefits are both quantitative and qualitative in that they relate to income levels, increased choices in employment, occupational achievements resulting from the use of knowledge, skills or expertise, opportunities for self development, social development, an increased ability to contribute as a citizen or as a member of society and the personal satisfactions which may result from education.

The study of the graduates of one institution may be of value to other universities or colleges in the following respects: (a) in providing a basis of comparison for other institutions which have engaged in or are planning similar research; (b) by contributing concepts, methodology, research instruments, and results which may reveal strengths and weaknesses and, thus, may be helpful to others in subsequent endeavors; (c) by serving as a stimulus for more research activity in the study of graduates of postsecondary educational institutions; and (d) in drawing attention to the possible uses for resultant information in meetings with state commissions on higher education, state budget committees, institutional budget committees, and academic planning groups.

The University of Colorado Study of Graduates

A large-scale survey was conducted in 1974-75 with a questionnaire mailed to 5,833 graduates who had obtained baccalaureate or advanced degrees from one or more of the schools or colleges on the four campuses. There was a 52% return of completed questionnaires which was representative of the sample.

In preparation for the study, a sampling matrix was designed to provide the number of graduates from each school or college and the year the degree was received (1890-1973). Computer runs provided the numbers in each of the resultant cells and selected a random sample of 10% from each cell.

The Development of the Questionnaire and Its Contents

The questionnaire was developed with input and revisions by top administrators, the Council of Deans, and the Faculty Committee on Teaching. It was designed to make comparisons among baccalaureate and advanced degree recipients from each school or college on the four campuses of the University spanning the years, 1890-1973.

The 125 items in the questionnaire include the following areas:

Characteristics of the graduates when they were students:
  Class level when enrolled, Colorado residents or non-residents, degree(s) awarded, school or college, years of degree awards, and campus on which most work was completed.

First employment:
  How was it secured, and was the degree required?

Present occupational classification or former occupation, if retired:
  Is the University education necessary for the present position? Have knowledge, skills, expertise obtained in undergraduate or graduate education been used in employment? Is a graduate degree required? Would the income be less, the same, or more without a baccalaureate or graduate degree? The present income, or the highest income, if retired.

Comparisons of graduates' occupations with those of their fathers. The degree of gain or no-gain while at the University in:
  Problem solving, self-understanding, written and spoken expression, appropriate emotional control and expression, relating to people, making close friends, appreciation for persons of other races or ethnic backgrounds, becoming better informed about social or domestic issues and international relations, ability to make ethical decisions, appreciation for the arts, and technical or scholarly knowledge.

Evaluations of courses and instruction.

The bases on which courses are evaluated:
  21 items with two 5-point scales comparing graduates' present-day evaluations with those they believe would have been made as students.

The need for options or alternatives in academic programs:
  Individually structured majors, intercollege or school majors, academic credit for applicable work experience, and advisability of majoring in one discipline.

Evaluations of student services: (5-point scale)
  Academic advising, counseling about personal problems, careers and occupations, financial aid, part-time student employment, job placement, and where these services were received.

Preparation for life situations:
  Citizenship, occupational and career training, interest in involvement in community or public

needs, issues, problems and preparation for a relatively satisfying life.

What determines a student's attitudes toward the University?

Present-day/student-day comparisons on 5-point scales.

Present activities in educational, political, professional, and charitable or religious organizations.

Continuing contacts with the University: extent and nature.

Some of the highlights of the graduates' responses to a number of these items are surveyed in this paper, with brief interpretive comments.

Income as an Outcome of Higher Education

The median annual income for all graduates who received baccalaureate degrees, 1890-1973, was $14,242 compared with a $20,401 median income for those with graduate degrees.

These income levels must be viewed from the perspective of changes which have occurred over the span of 83 years and by consideration of differences among the schools and colleges. Those who graduated with baccalaureate degrees from 1890 to 1920 had a median annual income of $12,000 but this jumped to more than $22,000 between 1920 and 1940, then steadily declined to $8,000 for those in the 1971-1973 period (Figure 1). Graduate degree recipients from 1890 to 1920 were at the $15,000 level of median annual income which rose dramatically to $50,000 in the 1940-1945 period and declined to $12,000 for those who received degrees from 1971-1973 (Figure 1).

In comparison to the 1940-1945 period, there were lower incomes for both baccalaureate and graduate degree recipients from 1945-1973, a period when incomes in the country were increasing rapidly. This must indicate that, though entry level salaries in employment were high in the 1960s, the graduates who had been in their occupations for 30-35 years were more established and consequently realized more income. The peak income for all graduates would come at about 55 years of age.

A hasty glance at the profile of the graph in Figure 1, with steadily declining median annual incomes from 1945-1973, might lead to the conclusion that higher education has become less important in recent years. On the contrary, educational attainment has increased the probability for higher income, as Deutermann (1974) from the Bureau of Labor Statistics reports:

> Although the real income of all workers has risen substantially over the preceding two decades, the greatest increase has occurred among the most educated workers. According to the 1970 census, the median income of men 25 and older with no more than an elementary school education was only 42 percent of the income of college graduates in 1969. This differential had increased over the preceding two decades. Since 1949, the median income (in 1969 dollars) of men with only elementary schooling has increased by 63 percent, that of high school graduates by 69 percent, and income of college graduates by 87 percent.

An advanced degree was not as important prior to 1940 as it has been since that time, in producing higher income, as evidenced in Figure 1. From 1920-1930, the baccalaureate degree recipient's median income was $23,000 compared to $18,000 for those with graduate degrees. This situation reversed in 1940-1945, when median incomes for graduate and baccalaureate degree recipients were $50,000 and $22,000 respectively. Since 1940, there has been a consistent trend for graduate degrees to bring higher incomes. Deutermann (1974), in the Bureau of Labor Statistics report, provides an explanation:

> In the decades since the end of World War II, the average educational attainment of the population and labor force has been steadily increasing. . . . While workers have achieved more education than in former years, technological changes have increased the complexity of many jobs and created a demand for the more educated worker.

When the median incomes of all the degree recipients from 1890-1973 for each school or college are compared, the highest are medicine ($32,499) and law ($26,670) with engineering ($20,294) and business ($19,451) as third and fourth. Pharmacy was next at $17,231 followed by arts and sciences, journalism and education at $12,758, $12,499 and $12,312 respectively. The lowest income levels were environmental design (architecture) $11,730, music $11,749, nursing $10,876, and arts and sciences certificate in education $9,614.

The Effect of Degrees on Income, Perspectives of Graduates Across the Schools And Colleges

The responses of baccalaureate and graduate degree recipients, 1890-1966, across the schools and colleges, ranged from 75-100% believing their incomes were more than they would have been without their degrees. The responses of those who received degrees from 1971-1973 maintained this trend with some exceptions. These recent graduates have not established themselves and they confronted declining job markets. Even in this period, most graduates believed that incomes were higher because of educational attainment. Very few graduates felt their incomes would have been higher *without* the degree, only 5% of the arts and sciences baccalaureates from 1971-1973, for example.

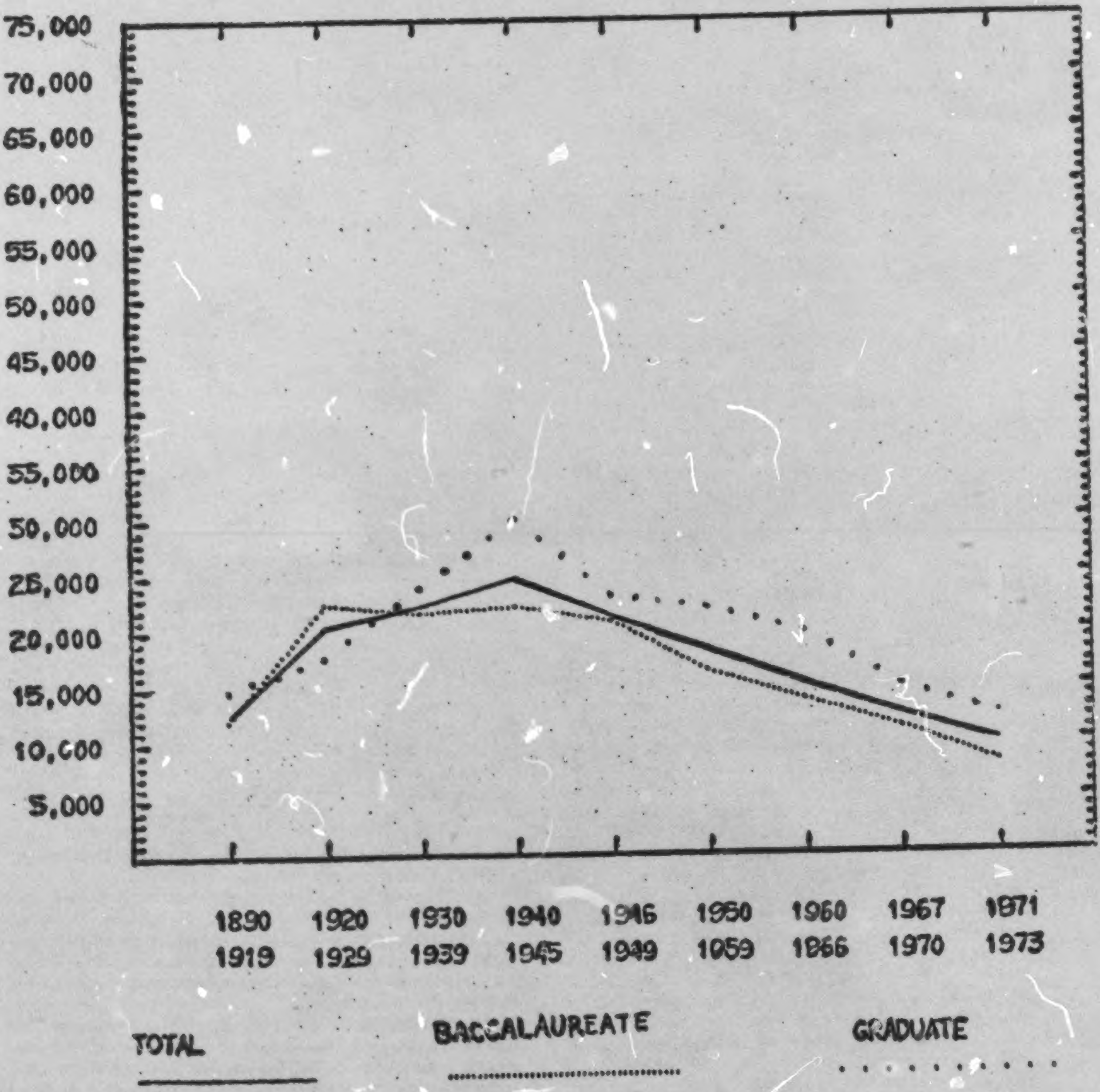
The Necessity of Degrees for the First Employment

Across the business, professional, and technical schools, graduates from 1890-1973 affirmed that they could not have obtained their first employment without a degree. The responses ranged from 67% for business baccalaureates to 100% for graduate medical degrees. The arts and sciences degree recipients followed this pattern quite consistently until 1967. In the period, 1967-1973, the percentages of arts and sciences baccaulaureates who believed their degree was necessary for the first job fell from 54 to 29. This 29% figure did not hold for advanced degree recipients, 1971-1973, 70% of whom indicated that they could not have obtained their first employment without the degree.

These statistics indicate that in recent years when the job market has tightened, an advanced degree or a degree from a business or professional school has been much more helpful in obtaining entry positions. This view is substantiated by the responses regarding the use of knowledge, skills or expertise in employment. For example, 96% of arts and sciences graduate degree recipients in the 1971-1973 period stated that in their employment they used knowledge, skills, or expertise obtained in their education, compared to a 58% response for arts and sciences baccalaureates in this period. Comparison of arts and sciences with professional degrees, in education for example, reveals that 79% of the education baccalaureates experienced

Figure 1

MEDIAN ANNUAL INCOME OF GRADUATES OF THE UNIVERSITY OF COLORADO, 1890-1973 (ALL SCHOOLS AND COLLEGES)



the use of knowledge, skills, or expertise in employment (58% for arts and sciences), while 97% with advanced degrees in education (96% in arts and sciences) gave affirmative responses to this question.

This trend toward more specialized training for employment can have a serious impact upon society over time. Budget requests of institutions of higher education are viewed favorably when they are supported with statistics that evidence high percentages of graduates obtained employment. Obviously, specialized training produces this result. The consequence is that less support may be given for liberal arts or general education. If the assumption is sound that liberal arts courses help students form values, attain historical perspective, and function better as educated citizens, the trend toward increased specialization with little emphasis on the liberal arts will produce deleterious results.

University Education and Occupational Achievement

In attempting to discover the outcomes of university education from the perceptions of University of Colorado graduates, there was interest in determining not only the effects of education on obtaining the first position and the resultant levels of income, but also how much education was responsible for their present positions.

When all responses from 1890-1973 for all schools and colleges are grouped, 59% of those with baccalaureates and 74% with advanced degrees stated they could not have obtained their present positions without their degree.

The responses varied across the years and among the schools and colleges. The more specialized professional or technical schools such as medicine, law, and engineering had responses ranging from 90-100% . The changes over the years were more extreme for arts and sciences graduates. From 1930-1967, baccalaureate degree recipients' responses ranged from 66-72% in believing their education was responsible for the present position, but fell to 36% for the 1971-1973 period. In comparison across the years nearly 90% of those with advanced degrees attributed their position to the degree until 1971 when the response was 81%

Occupational Mobility—Increased Occupational Choices

Occupational mobility as used here is not synonymous with socio-economic mobility, though there is a relationship. Some graduates increased their choices of occupation because of their education, but the choice did not always result in a higher income for the graduate compared to that of the father. Thus, higher incomes are not the equivalent of occupational mobility because of value judgments related to the choice of occupation and because some professional classifications have lower incomes than those for sales or skilled workers.

The responses of the total sample, including all schools and colleges 1890-1973, revealed that 2% of the graduates compared to 26% of the fathers were classified as skilled or unskilled or laborers. The greatest percentage differences between graduates and fathers were in the professional classification with 60% of the graduates and 25% of the fathers in this category.

There was a trend from 1890-1960 for the percentage of baccalaureate degree recipients in the officer-manager classification to exceed the percentage of fathers in this classification, but the situation reversed 19[illegible]0-1973.

What opportunities were offered for graduates to enter high income professions, such as law or medicine, if their fathers were classified in lower income occupations? The percentage of the fathers of graduates of the University of Colorado School of Medicine who were skilled, unskilled, or laborers ranged from 46-23% from 1920-1973. In the 1971-1973 period 38% of the fathers were in the office-clerical, sales, skilled, unskilled, or laborer classifications compared to 38% professional and 15% officers-managers.

One-third of the fathers of the graduates of the School of Law were in the skilled, unskilled, or laborer classification (1971-1973), 11% were office-clerical or in sales, 11% were professional and 44% were officers-managers. These percentages vary over the years 1890-1973, but there is a range of 22-2[illegible]% of skilled, unskilled, or laborer fathers during most of the time.

The occupations of the fathers of graduates from other schools and colleges followed trends similar to the School of Medicine and the School of Law, with an average of 30% in the skilled, unskilled, or laborer classifications.

There were more fathers of arts and sciences degree recipients in the professional and officer-manager classifications and fewer in the skilled, unskilled, or laborer categories than was characteristic of all other schools-colleges for the period 1890-1973. In the 1971-1973 period 38% of the fathers were classified as professional, 23% as officers-managers, 13% in office-clerical or sales, and 19% in the skilled, unskilled, or laborer categories.

In summary, many degree recipients whose fathers were in lower income occupations were enabled by higher education to enter higher income professions such as medicine or law. Across the professional schools, many graduates moved into professional or officer-manager occupational classifications whose fathers were not in these occupations. This was characteristic of arts and sciences degree recipients, excepting baccalaureates in 1971-1973. This was the only period in the 1890-1973 span of years that the number of arts and sciences baccalaureates in the professional and officer-manager classifications did not exceed the numbers of fathers in these classifications. The reasons were that 15% more enrolled in graduate studies, there were 10% more graduates than fathers in the office-clerical and sales classifications, and there were 10% more baccalaureate recipients in the skilled, unskilled, and laborer categories than in the 1967-1970 period. Even though the mobility for arts and sciences baccalaureates to professional and officer-manager classifications was not as impressive in 1971-1973 as previously, it must be remembered that these are recent graduates and their ultimate occupational classification can be determined better at a later time.

Other Outcomes of the University Experience—Personal and Social Development

The outcomes or benefits of a university education occur not only in the areas of income and employment. The questionnaire included 16 statements on self development and social development and ascertained the relative gain the graduate felt he made in these areas because of his experiences at the University.

The highest percentages of graduates who reported high or average gain were in the following areas: (a) technical-scholarly knowledge (87%), (b) problem solving ability (8[illegible]%), (c) skill in written-spoken expression (79%), (d) increased ability to relate to people (71%), (e) adequate occupational and career training (71%), and (f) increased self understanding (70%). Only 4% of the nearly 3,000 responding graduates in the sample reported little gain or no gain in technical-scholarly knowledge and only 8-15% reported little gain or no gain in the other 5 areas.

Approximately one-half of the graduates believed they gained in the personal development areas of appreciation for the arts, the appropriate expression or control of emotions, and the ability to make ethical decisions. About one-half were aware of social development gains in becoming better informed about social issues and international relations, in developing an appreciation for persons of other races or ethnic backgrounds, and in an increased interest in becoming involved in community and public issues and needs. There is a substantial participation level in educational, professional, charitable-religious, and political organizations, but it is not extremely high.

Evaluation of Academic Programs

The graduates were asked to evaluate the quality of the courses they took and the instruction they received while at the University. One-fourth of the courses and instruction were rated excellent, 51% were considered good, and three-quarters of the total were positively evaluated. On the other hand, one quarter of the University's courses and instruction were evaluated as poor by its graduates.

The responses of the baccalaureate and graduate degree recipients of each school and college are fairly similar to those of the overall sample. With some exceptions, there is a trend evident since 1950 of more courses evaluated as poor and fewer courses evaluated as excellent. There was also a tendency for graduate degree recipients to evaluate courses higher than baccalaureates, with larger percentages of excellent and good courses and lower percentages of poor courses. The evaluations of instruction correlated with these trends.

The results of the responses of graduates are clear. Although the overall increase in poor evaluations over the years and the accompanying decreases in excellent ratings are partially counter-balanced by increases in good ratings, there has been a general decline in the quality of instruction and courses since 1950.

Interpreting the reasons for this decline is a difficult task, but several possible hypotheses are offered here. First, there has been an increasing demand since the 1950s for universities to assume a more active role in service and research. This demand was accompanied by increased enrollments throughout the nation and, even though funding for universities reached an all-time high during the 1950s and the 1960s, the tremendous demands for instruction, research, and service were perhaps not adequately met.

Secondly, in an earlier research, Henard (1973) found that 85% of the University of Colorado faculty members do not believe that promotion and tenure are based primarily on an estimate of teaching effectiveness, and 61% do not believe that department chairmen or other administrators attach as much importance to demonstrated teaching ability as to potential for scholarly contribution when new faculty members are recruited. Thus, the decline in the evaluations of courses and instruction may be partially because teaching effectiveness is not rated higher in the reward system for faculty. This does not mean that research and scholarly contributions are unimportant. They are considered necessary for excellent instruction. The faculty members must be indicating, however, that instruction needs a higher rating for rewards and in recruitment.

Another consideration in the decline of evaluations of courses and instruction in the past 20 years is the changing nature of the student body. Scholastic Aptitude Test scores and other test scores indicate that students enter the University with more academic preparation than in the past, even when very recent declines are considered. These students probably have higher expectations than did former students and their evaluations are, therefore, lower.

Summary and Conclusions

The results revealed that predominant perceptions of graduates with baccalaureate or graduate degrees were that their university education was necessary for first employment, for their present position, and that it produced higher income. Graduate degrees or specialized professional training have become more necessary since 1940. Higher education, however, enabled 50% of both baccalaureate and graduate degree recipients to increase their occupational choices over those of their fathers. In addition to occupational and income benefits from university education, the graduates realized intellectual, personal and social gains in development.

The evaluations of courses, instruction, academic advising and other student services emphasize that attention should be given to the areas needing improvement. The results may be used in meetings with official state bodies and on the local campuses in budget considerations and in academic planning, and can serve as a basis for similar research at other institutions.

The conclusion is that postsecondary institutions can discover that their graduates are one of the best sources of information supporting the benefits of higher education and in determining the academic programs and student services which need improvement.

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SLOWING STUDENT ATTRITION: AN ACTION RESEARCH PROJECT ON ACADEMIC ADVISING

Dennis L. Bates, Drake University

During the opening weeks of the Hill Family Foundation project on academic advising at Drake University, academic advisors reported the following cases. The reasons given by these freshmen are typical of those voiced by students at many universities.

> "Daryl withdrew on August 22nd, just before classes began. The Assistant Dean reported that he arrived for summer orientation, stayed-on by camping near the river, worked at the State Fair—and then left because 'this (Des Moines) is just too far from home.' "
>
> "Patrick withdrew on August 31st. He left for personal reasons at home, also saying 'I just don't think I could change into the environment here.' " His advisor reported that as a member of a fundamentalist religious sect, Pat felt that Drake was Sodom and Des Moines was Gomorrah."
>
> "Karen withdrew on August 31st. It appears she attended Drake only to please her parents and that her own motivation 'was idle curiosity.' She thought her attitude might have been different had she attended our summer orientation program."
>
> "Edward withdrew on September 13th. His advisor reported that he has a serious vision problem; his glasses are so thick that he must remove them to read—when he does, he lowers his head so that his nose is actually on the book. Some previous advisor assigned him to five reading classes."
>
> "Debbie withdrew on September 17th, about a month into the semester. She had attended Drake's Summer Session and had achieved fairly well, mostly Bs and Cs. In the Fall, she became entrapped in English—and left, saying she 'would be satisfied only with A grades.' Her ACT Composite is 15 and she ranked in the bottom half of her high school class."

I imagine you could find very similar cases at your own institutions with very little difficulty.

Drake did not begin the Hill Advising and Retention program without some prior experience. Through good planning and good luck we had experimented with two limited programs, elements of which were incorporated into the Hill Project.

In 1971 the College of Liberal Arts tried an intensive advising program for freshmen and sophomores who appeared to be in academic difficulty. Certain faculty advisors were paid $200 overload during the Spring semester—and in return tried to contact advisees by telephone to get the student in for a visit. Advising efforts concentrated on reading and study habits, test taking strategies, and very limited referrals to other University agencies. "Special Counseling," as it was called, enjoyed a modest success, not so much in the effect on students but on faculty attitudes. Many faculty were pleased at the additional contact—and we learned that the general student complaint "I only see my advisor twice a year to get my schedule signed" was a two-way street. Advisors enjoyed the student contact, but they had only a limited mechanism for that contact.

The second program providing experience for the Hill Project was, and is, the Transitional Services Program. Transitional started with 19 students in the 1969 Summer Session and now regularly enrolls 100 in the Fall term and another 20 or so in the Summer.

Transitional provides *directed study* for one semester. It includes required work in reading and study skills, and intensive consultation with a Transitional counselor. It is one of the few programs at Drake that provides no financial aid, places strong, written conditions on continuation past the probationary semester—and is oversubscribed by applicants! The six years of dealing with these "predicted failures" has supplied much of the experience we drew upon in writing and implementing the Hill Advising Project.

The Hill Project

This is the second year of a project funded by the Hill Family Foundation of St. Paul, Minnesota (now the Northwest Foundation) under their Independent College Program. The Hill Family Foundation serves a seven state area that includes Iowa. First year funding at Drake was $93,000 and second year funds are over $80,000. There are three main parts to our program and five secondary objectives. These objectives are outlined in Table 1. All of the systems—Advising, Exit Interview, and Course Prediction—are up and going. In addition, the secondary objectives are either completed or are on a continuing basis. For example, the Center for the Study of Retention continues to provide free consultation service to institutions within the Hill area. We also publish a newsletter, *RETAIN*, that has articles from Hill-area colleges and universities about other advising and retention programs.

As indicated earlier, the Hill Project was an outgrowth of previous experiences with various groups of exit-prone students, plus the shock of a student flow-model which indicated we are losing, on the average, slightly over 45% of our new, entering students within 2 years. The program also started because Hill invited applications for grants from private colleges and universities in their service area of Iowa, Minnesota, the Dakotas, Montana, Idaho, Oregon, and Washington. The previous studies, the flow-model, the Hill invitation—and the obvious concern of a private university to find ways to *retain* more students—all came together very neatly.

There were some other underlying concerns, some that may bother other institutions:

1. There was a need to know more about Drake students and the Drake campus environment.
2. We wanted to find ways to reduce the dissonance that students felt, dissonance that contributes to attrition.
3. We felt strongly that Academic Advising is clearly different from counseling (in the student life context) and that our Academic Advising needed a close look.
4. Some of us on the staff accepted the premise that not all faculty should advise students—and that even those who do advising well can use more aids.
5. We also felt that an institution composed of professionals should act professionally when we first deal with our clients. We used the analogy of seeing a medical doctor or an attorney where one would be highly suspicious of a practitioner who did not take a full case history or probe exhaustively about a legal problem. We needed to analyze our students (clients) similarly.

Program Functions

For students, the first year of the program served nearly 300 freshmen identified as "Exit-Prone" through a combination of low ACT Composite score or low SAT verbal and math scores, low high school rank, or a positive score on an instrument designed to predict LEAVERS, not using academic background. Students were assigned to a Hill academic advisor by their college Dean. The design of the program provided very intensive contact—at least once a week for a minimum of 30 minutes—during the start of school. Contact tapered off during the Spring semester. Thus, exit-prone students were placed in an almost tutorial relationship with their Hill academic adviser.

Fourteen faculty of instruction were selected to participate in the Hill program. In addition to meeting with their selected advisees, they attended weekly training sessions, reviewed cases presented for discussion, kept a log or diary of each advising session, learned about Drake's referral and helping services, and learned to take the initiative in contacting and helping an advisee instead of waiting for a crisis.

Among deans and general faculty there is little overt change in behavior, which is not surprising since that is not what the program set out to do. There is, however, a basic shift in awareness about the need for good academic advising, and particularly about the need to slow student attrition. Much of the latter may be due to the general crunch in higher education rather than the Hill program at Drake.

Among the University community there is a much greater awareness that our attitudes toward students are very important in keeping them at Drake. Before the Hill program, very little conversation was heard about the need for the Registrar's office, the Cashier's office, the Library staff, or any other support service to pay much attention to attitudes about students. Today, we can say with certainty that support services are very much *aware* of the need. Changes, however, come about more slowly. *Does it work?* Humanistic academic advising does work at Drake. Attrition for the "Exit-Prone" group was definitely slowed over the *academic* year—and there appears to be a contribution to the general retention rate between the freshman and sophomore year.

Table 1
HILL ADVISING PROJECT
DRAKE UNIVERSITY

Basic Objectives of the program:

ADVISING:

1. Identify "Exit-Prone" freshman students
2. Create a cadre of "Humanistic" academic advisors
3. Provide advising tools
4. Reduce attrition

EXIT INTERVIEW SYSTEM:

1. Create a rational exit system—for all students
2. Create a usable data base
3. Train "exit interviewers"
4. Learn where Drake is wrong

COURSE PREDICTION:

1. Evaluate grading patterns in common courses
2. Predict chances of success
3. Create a new tool for advising
4. Create a new tool for student self-advising

Secondary Objectives of the program:

1. Create a bibliography on retention programs
2. Write an advisors aids book
3. Implement training techniques for academic advisors
4. Use an Advisor Perception Inventory as a check
5. Start a Center for the Study of Retention

Table 2
ATTRITION FROM THE 1973-1974 FRESHMAN CLASS

	Fall with-draw	Spring non-return	Spring with-draw	Total Academic Year With-draw	Losses over Summer	Total Losses
Exit Prone N= 280	13	12	5	30	55	85
Cohort N= 615	26	58	22	106	26	132

Table 2 shows, in brief, what happened to the 895 freshmen who started the Fall 1973 semester. Of that group, 280 finally ended up in the exit-prone group and received the intensive academic advising. The balance of the class was followed simply as a cohort group and received only the usual advising contacts. For the academic year, the exit-prone group had a loss rate of 13% while the cohort group had a loss rate of 17%. It must be recalled that the exit-prone group also started out with much weaker academic preparation. The losses over the summer tipped the balance in favor of the cohort group; it appears we were able to reduce freshman year attrition, but the effect was not powerful enough to carry over into the next year. However, as Table 3 indicates, we were able to affect the overall retention rate of freshman students.

The retention rate has increased among the entire freshman class and we feel that more of the Hill group returned in the Fall of 1974 than we would have normally re-

Table 3
RETENTION THROUGH THE BEGINNING OF THE SOPHOMORE YEAR

	NUMBER OF FRESHMAN	NO. RETURNING AS SOPHOMORES	RETENTION RATE
1968 FRESHMEN	1137	707	62%
1969 FRESHMEN	1133	832	73%
1970 FRESHMEN	1185	856	72%
1971 FRESHMEN	1252	897	72%
1972 FRESHMEN	1062	729	69%
1973 FRESHMEN	895	678	76%

Table 4
ADVISOR PERCEPTION INVENTORY

	ITEM	YES	NO
1.	My advisor has been readily available for consultation.		
2.	My advisor has been genuinely concerned about my welfare and has been actively helpful.		
3.	My advisor has served as a resource person for me.		
4.	The spirit and practice of continuous self-evaluation has grown through my advisor.		
5.	I enjoy my regular interview sessions with my advisor.		
6.	My advisor encourages me to express my opinions about Drake.		
7.	My advisor listens to problems I encounter.		
8.	My advisor knows when I do not follow his/her conversation.		
9.	Major points of my regular interviews have been summarized by my advisor.		
10.	My advisor has helped me with personal problems.		
11.	My advisor has taken an interest in me.		
12.	My advisor and I spend most of our time discussing academic problems.		
13.	I believe my advisor anticipates needs that I have.		
14.	I believe my advisor has helped make the transition from high school to Drake smoother.		
15.	I would willingly share problems I encounter with my advisor.		
16.	My advisor has introduced me to various organizations within Drake.		
17.	My advisor has been well-prepared for each interview.		

tained without the Advising and Retention program. If this pattern holds for four years, then we will have solid evidence that humanistic advising contributes to holding these kinds of students.

Students who were part of the program liked it, faculty liked it. We also have some evidence other than verbal expression that this kind of advising not only works, but also is desirable.

The Advisor Perception Inventory, illustrated in Table IV, was constructed by our Hill Research Associate. The table is a simplified version; the actual instrument allowed a student to repond on a scale from strongly agree to strongly disagree. It was administered in the Fall and again in the Spring to all the Hill students and to a sample of the Cohort group.

What we found were some major differences in perception of advising between the Hill group and the Cohort group, some of them statistically significant. In fact, only items 11 and 12 were not significantly different at the .001 level. We feel that this kind of response from students receiving differentiated treatment is solid proof of acceptance of humanistic advising by the Hill students.

As might be expected, the advising portion was not without some problems:

1. There was initial faculty fear of being turned into a junior counseling psychologist.
2. Advisors were hesitant to initiate contact with students.
3. They were unsure of referral services or procedures.
4. Faculty were unwilling to "think Drake"; they were tied to their college—or department.
5. They were hesitant to advise a student out of Drake.
6. They were hesitant to keep logs or journals.
7. They were unsure of how to handle a student complaint about a fellow faculty member.

All of these fears and hesitancies were met, if not overcome, through the group sessions. Hill academic advisors discovered they were not alone in facing these problems.

The second major section of the program was the creation of an "Exit Interview System" and related data bases. Of course we had an exit system—it simply did not work. The thrust of the Hill exit system lay in charting the actual processes a student must go through to formally leave the University and then trying to persuade advisors, deans, and support staff to follow the chart. We did not create a new process for exiting; we simply wrote it down. In addition to thinking through the exit system, we did create an exit interview form, set-up for keypunching and given only to those trained interviewers who actually conducted the exit interview. Table 5 illustrates the content of the interview.

The system is fine, but like bureaucracy, it only fouls up when people are plugged in. There is close control on Hill student withdrawals because of the advisor contact so a good data base is being established for that group. Probably only 25% of others, including upperclassmen, who withdraw are being interviewed. Students slip by in Dean's offices, the cashier, the Registrar's office. This slippage really destroys the analytical power of the exit system and data base. You must be very hard-nosed about exit data if you want to know why people leave your institution after you have put out your best efforts to retain them.

The final mainpart of the program was creation of course prediction matrixes; there are about 30 or so of these. The original purposes were several:

Table 5
EXIT INTERVIEW CONTENT

(10) ____________ NAME

(1) ________ S S #

(16) M F SEX

(17) ____________ COLLEGE-REGISTRATION

(18) FR SO JR SR GR CLASSIFICATION

(19) ____________ YEAR/SESSION-INITIAL ENROLLMENT

(35) ____________ MAJOR

CHECK THE FOLLOWING WHICH APPLY:

(38) HOUSING
- ____Lives in dorm
- ____Lives in sorority/fraternity
- ____Lives at home
- ____Other off-campus housing

(39) STUDY HABITS
- ____Less than 10 hrs a week.
- ____Between 10 & 20 hrs per week
- ____More than 20 hours per week

(40) RETURN TO DRAKE
- ____Yes, after one semester
- ____Yes, after one year
- ____No

(41) PLANS
- ____Go to other school
- ____Has job waiting
- ____Plans to find job
- ____Entering military
- ____Marriage
- ____Other. What? ____________

(43) HELP RECEIVED ON THIS DECISION
- ____Dean
- ____Professor
- ____Parents/relatives
- ____Other students
- ____Academic advisor
- ____Counseling center
- ____Student life
- ____Other. Who? ____________

(45) ____Car on campus
(46) ____Receives Inst. Financial Aid
(47) ____Has informed parents
(48) ____Has two close friends here
(49) ____Participated in 1 out-of-class activity per week
(22) ____Enrollment continuous

(68) CONTENT OF INTERVIEW
- ____Eliciting on information
- ____Listening
- ____Referring to other services
- ____Advising
- ____Counseling
- ____Informing of opportunities
- ____Considering alternatives
- ____Helping student think thru issues
- ____Giving information

(69) BEHAVIOR OF STUDENT DURING INTERVIEW
- ____Hostile
- ____Non-responsive
- ____Responsive
- ____Neutral
- ____Open

(70) RESULT OF INTERVIEW
- ____Much negative effect on student
- ____Some negative effect on student
- ____No effect on the student
- ____Some positive effect on student
- ____Much positive effect on student

(59) ____Reason for withdrawal indicated by student appears to be real one.

(63) What was his chief reason for attending Drake in the first place?
____

(64) What was his major reason for leaving?
____

(66) Please state your analysis of the reason for this withdrawal:
____

(79) Possible preventive action by Drake: ____________

(33) ____________ ACT COMPOSITE SCORE

(54) ____________ SIGNATURE OF INTERVIEWER

1. To help find sections that better fit a student's measured abilities;
2. To advise after a schedule is built: how good a job did the advisor do?
3. To offer a quick fix for a student who is in academic peril; where is a section that offers a chance of survival?

Prediction matrices are guides only, but they were perceived as a real threat by some. Consequently, they have not been widely used.

Can other institutions implement a program of this type? The answer is a qualified "yes" which is dependent upon four variables. These variables take the form of self-examination questions.

1. Do you perceive an attrition-retention problem on your campus?
2. If yes, do you know about how many students you lose, when you lose them, and for what reasons?
3. If yes, are your line officers, deans and department heads also aware of losses and reasons?
4. Does your faculty truly understand the relationship between retention of students and institutional financial health?

If you can respond "yes" or even "semi-yes" to the above, you can start an academic advising program, tailored to your campus and your conditions, using the general model developed at Drake.

The greatest difficulty in starting a program of this kind is not in the mechanics but in convincing faculty and officers of its utility—the problem is attitude, not administration.

Table 6

CHANCES IN 100 of OBTAINING A "C" OR HIGHER IN BIOLOGY

The Biological Sciences (603-002)

ACT COMPOSITE SCORE	HIGH SCHOOL GPA		
	C	B	A
30 and above			99 (100)
25 — 29	89 (71)	95 (81)	98 (100)
20 — 24	67 (65)	81 (86)	89 (95)
16 — 19	42 (75)	59 (80)	
15 and below			

Observed frequencies are expressed in parentheses. Cells containing less than five observations were not reported.

If no information is available on the student, chances of getting a "C" or higher are 81 out of 100.

The expected withdrawal rate from this course is 12% . The typical withdrawee had an ACT composite score of 21 an a "B-" high school GPA.

ATTRITION AT A NONTRADITIONAL INSTITUTION

A. Paul Bradley, Jr. & Timothy Lehmann, Empire State College

Attrition studies grace shelves throughout academe. Despite impressive methodological schemes and lofty expectations among institutional researchers, the results too often have fallen into the faint praise realm of "interesting."[1] However, the current and projected reduced enrollment pool in American higher education creates a climate in which information about leavers is valuable and necessary. Almost all institutions need to learn such things as whether they have programmatic features that are driving people away, what types of students they serve well, are there important groups—minorities, older, brighter, financially disadvantaged—not well served, and what changes might help retain current dropouts? Into this evolving scene, Empire State College (ESC) has arrived with an explicit mandate from New York State to serve students previously not well served and to *monitor* its success and failures.

At the previous two AIR Forums, we have presented aspects of Empire's comprehensive research and evaluation program. A cornerstone of the program is to conduct studies which reflect several perspectives: administration, faculty, students, state officials, and others. This paper will detail the strategy for attrition research at ESC and discuss implications of the findings in terms of the multiple perspectives.

Problems for Attrition Studies at Empire State College

Empire, a statewide public college without a campus, has a year-round calendar and serves its students in a highly flexible manner that makes short-term step-out simple. Because ESC employs learning contracts rather than classes, the step-out student loses no ground by filling out a withdrawal form but merely makes no further progress until he/she decides to re-enroll. Re-enrollment also is accomplished by completing a straightforward form. Thus, the number of withdrawn students changes daily and only the recent development of equally flexible computer systems makes accurate attrition studies practical. ESC's nature also creates interpretation difficulties to go with these technical counting problems.

Some common findings in attrition studies are that students withdraw because of low grades, diminishing motivation, financial difficulties, homesickness, loneliness, dislike of roommates, illness, etc. (Astin, 1972; Fenstemacher, 1973; Iffert, 1965; Hannah, 1969). Most of these and other similar reasons either do not apply to ESC or apply differently because Empire serves a student body averaging 37 years in age with 60% employed full-time while studying and 63% married. The response "diminished motivation" for a 34 year old welder with a family is seldom another way of saying: "I want to hitchhike across Europe." Some factors that further complicate an ESC attrition study include the College's practice of granting up to 80% of a bachelor's degree on the basis of demonstrated prior learning leaving as little as six months of remaining study, the individualized degree programs that require students to specify objectives, and the primary role played by a student's faculty mentor in making ESC a rewarding learning experience.[4] Furthermore, to fully understand the difficulties of studying withdrawals at Empire, these unique factors must be added to the problems inherent in attrition research for any institution: determining why the students enrolled in the first place, deciding which withdrawn students are indeed dropouts, achieving an adequate response rate, obtaining candid answers, and ending up with findings that can be compared to those on studies at other institutions (Summerskill, 1962).

A Strategy for Assessing Attrition

A premise of the three-year cost/effectiveness project of the ESC Office of Research and Evaluation is that the appropriate way to examine effectiveness is to use quantitative measures in concert with qualitative techniques (Bradley, 1974). This premise has similarly guided our strategy for assessing attrition, an element of the cost/effectiveness study. Aspects of both the quantitative and qualitative techniques will be applicable to attrition studies at many institutions, both traditional and nontraditional.

Quantitative

When Empire State College's computer systems are fully operational, we will have three types of attrition counts: temporal, activity, and degree progress. The temporal count provides the most comprehensible data and helps with an immediate problem at Empire, defining attrition.

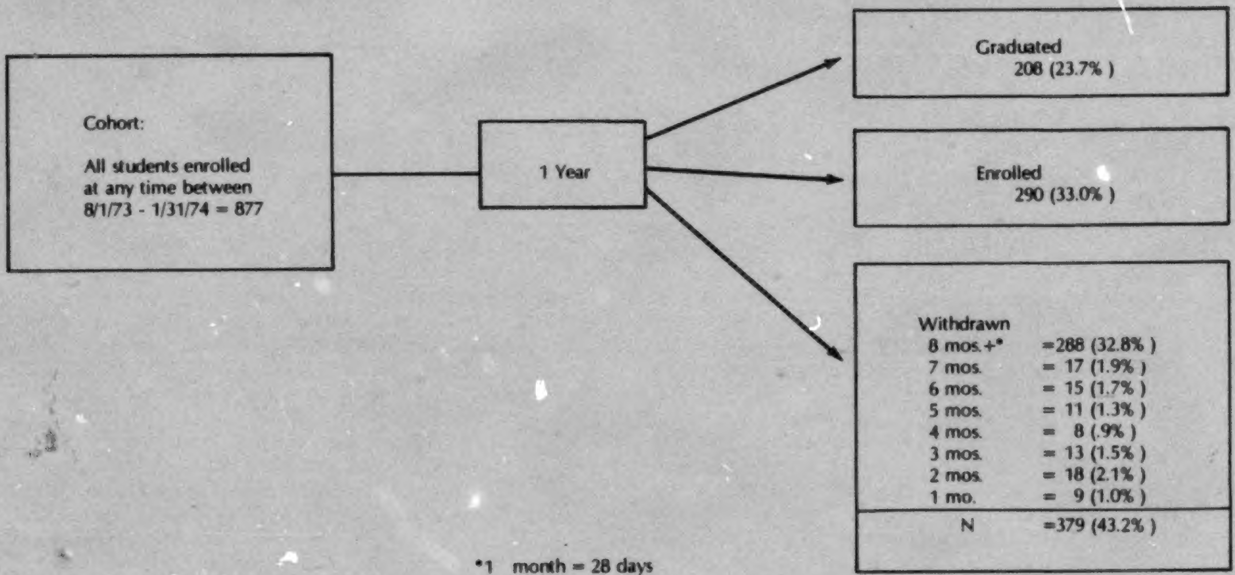
Short-term withdrawal, as noted earlier, is encouraged at ESC so we needed a way to decide when a step-out becomes a dropout. Early experience with the temporal count which monitors the length of time that students in a given cohort remain withdrawn suggested that an appropriate definition of attrition is: a student withdrawn suggested that an appropriate definition of attrition is: a student withdrawn for eight consecutive months or more. This span of time is roughly equivalent to two traditional semesters and provides modest comparability to other studies. Many students withdrawn for less than eight consecutive months re-enroll.

The results of a temporal count taken on a cohort established in 1973-74 are on Figure 1. Nearly one-third of the 877 is now "attrition." Some studies (e.g., Astin, 1972; Fenstemacher, 1972; Chickering & Hannah, 1969) indicate that this is not a particularly high rate for a college in the first year. However, Empire's unusual, often highly educated student generally receives much advanced standing and can in no way be termed "freshmen." As data is received from similar institutions or dissimilar ones using a similar methodology, modest comparisons will be made.

Almost one-quarter of the cohort have taken advantage of Empire's advanced standing opportunities and graduated.

Figure 1

EMPIRE STATE COLLEGE ATTRITION: TEMPORAL COUNT



*1 month = 28 days

The remainder are currently enrolled (33%) or withdrawn for less than eight 28-day months (10%). We will continue temporal counts on the cohort until all are either graduates or attrition.

The second quantitative measure is the activity count which looks at how much successful effort a student has made at Empire. This count is important because a learning contract has no fixed length nor does it end until a student completes all specified work. Thus, two students might each be enrolled for ten months, one completing three contracts and a portfolio for advanced standing and the other nothing. Thus, the activity count helps measure how "tragic" was the case of a given leaver.

An activity count of the cohort leavers shows that 29% completed no learning contracts, 27% completed one, an additional 24% two, 13% three, 7% four, and 1% five. Since many graduates have completed their studies in two or three contracts, it appears that many leavers made a tangible commitment to their studies.

The third type of count, degree progress, also measures the extent of the personal "tragedy." This count looks at how far a student was from degree completion which can be determined as soon as the individualized Degree Program and the assessment of prior formal and nonformal learning are approved. The possible range is from 6 credit months to 32. Computer programs are not yet completed for this count so adequate data are unavailable. Our personal observations, however, indicate that few students drop out after portfolio completion and close to a degree.

Qualitative

The quantitative aspects of an attrition study are useful for planning and getting a sense of the magnitude of the withdrawal problem but, in order to make appropriate changes, it is more important to learn why people left and what might be done about the reasons. In tackling these problems, the ESC Office of Research and Evaluation has had excellent success with phone interviews which were first used while investigating attrition as part of the Self-Study for accreditation (Lehmann, 1974). Phone interviews are efficient in terms of overall time, well-received by respondents, give virtually a 100% response rate of those contacted, are inexpensive, are relatively unobtrusive, allow give-and-take on complicated responses, and provide the researchers with a sense of whether the respondent is being frank. Furthermore, analysis is often easier because coding of quantifiable items is done by the interviewer immediately after the interview.

In the 1975 phone interviews, we drew a two-thirds sample (189) of the attrition group and reached 94 (50%). One person declined to participate. Of those not reached, 56 (30%) had moved with no forwarding address or had left an incorrect phone number. The interviewers had an occasional chuckle over these as they reached Dial A Prayer, Weather Information, and the emergency number for a cemetery monument business. Overall, however, the phone technique was a great success as we went from the first call to computer-run marginals in 15 business days.

While findings are discussed at some length in the next section, a somewhat unexpected one affects the interpretation of the counts: 13 of 93 (14%) withdrawn students clearly were not dropouts in the true sense. Four students had used Empire as an enrichment of their studies in other colleges, 4 were technical withdrawals waiting for certain documents to be processed which would clear them for graduation, and 5 had already re-enrolled in the 25 days since they were identified on the temporal count. (The last group indicates that 8 consecutive 28-day months may not be a sufficient definition of attrition.) If the phone survey random sample group is typical of the overall attrition pool, a more accurate attrition rate after a year (Figure 1) is 28.3%, not 32.8%.

Findings of the Phone Survey

Characteristics of ESC Leavers

In Figure 2 we have compared selected demographic characteristics of ESC leavers and current students. The leavers were more likely to be typical college age, single, working full time, and enrolled as half-time students. The age and marital status findings seem to suggest that students in the modal categories for the College have a higher probability of completing their studies. Certain selected occupations also show the contrast between the two groups. For example, about 25% of the dropouts were employed in professional and semi-professional occupations (e.g., teacher, nurse, veterinarian assistant) compared to 32% of the current students. In contrast, 29% of the attrition group held blue collar jobs (e.g., telephone operator, machinist) while 21% of the current students held such jobs. For all other occupations, there was little difference between the two groups.

The basic finding above is not generally supported by other studies. F[illegible]macher (1973) found married persons more likely to leave. Although over half the ESC students who leave are married, it is the single group that shows greater likelihood to depart. However, Empire's "adult" student body probably makes such comparisons inappropriate. Astin's (1972) national study of dropouts revealed that more men than women persisted to graduation which also is in contrast to ESC data (Lehmann, 1974). Only McIntosh and Morrison (1974), in studies at the nontraditional Open University in England, have described demographic findings similar to Empire.

Reasons for Leaving

The attrition group gave several reasons for leaving Empire (Figure 3). By far the largest number of reasons were personal in nature. Of the leavers, 41% stated that health, family problems, or moving out of the community were the basic cause of their withdrawal. For example, one female student withdrew because of pressure from her spouse resulting from "too many meetings with her male mentor." Another left shortly after a serious injury befell her daughter. Still another found that job, family, and study were adversely affecting her health. Almost one third (31%) said that job-related problems were the basic reason for withdrawal. Leavers said that they could not handle the scheduling or reallocation of their time so that both college work and job responsibilities could be handled in a satisfactory manner. For example, several claimed that new jobs required too much of their time to also allow study. One man who trains unemployment insurance counselors said that he would return to Empire "when prosperity strikes again." Just over one-fifth (21%) of the dropouts cited poor relationships with their faculty mentors as a prime reason for withdrawal. Either the former students had a mentor they

Figure 2

SELECTED CHARACTERISTICS OF ESC LEAVERS AND CURRENT STUDENTS EMPIRE STATE COLLEGE ATTRITION STUDY

Characteristics	Leavers (N= 93)	Current Students (N= 483)
Sex: (Female)	47%	48%
Age:		
Average	37	37
Range	19-63	19-68
22 and under	22%	10%
Marital Status:		
Married	55%	63%
Single	34%	27%
Other	11%	10%
Employment: (Working Full Time)	73%	60%
Occupations:		
Professional	9%	11%
Semi-Professional	16%	21%
Skilled	3%	1%
Semi- or Unskilled	26%	20%
Housewife	2%	9%
Student Status:		
Full Time	55%	60%
Half Time	45%	40%

Sources: Attrition Phone Survey, ESC Student Experience Questionnaire, and College files.

Figure 3

REASONS FOR WITHDRAWAL EMPIRE STATE COLLEGE ATTRITION STUDY

Reasons for Withdrawal*	Percent
Personal problems (e.g., health, family obligations, moved away)	41
Job problems (e.g., too demanding of my time)	31
Mentor problems (e.g., did not like, unproductive relationship)	21
Financial problems	15
Problems with ESC program and/or procedures (e.g., confusing, too much independence for me)	15
Problems with bureaucracy (e.g., billing)	12
Problems with portfolio	12
Problems matching my goals to the College	9
No problems	5
Transfer to another college	4
Found ESC too structured	1
Other	6

*Since many respondents identified more than one reason for leaving, the percent total does not add up to 100%. The percentages were based on the number of responses for each reason.

did not like or the relationship was unsatisfying and unproductive. For example, one felt that ESC was not recruiting mentors who relate to people, but rather "scholars." One was crushed by a mentor who did not feel she was doing acceptable work though "I've always been an 'A' student. I can show you transcripts." Financial problems and problems with ESC's program each accounted for 15% of the reasons. Problems with ESC's "red tape" (especially with the billing process) and with the preparation of a portfolio for advanced standing were both cited by 12% of the leavers.

The basic conclusion we draw from this data is that the top reasons cited for leaving are external to the College (personal and job problems). Problems with the faculty mentor are the major internal reason cited. Between one-sixth and one-tenth of the leavers identified problems with the portfolio for advanced standing, problems with ESC's program and/or procedures, or a poor match between personal goals and College objectives. An example of the student goal and College mismatch is one student who found no mentor in yoga and left for California. A minority of leavers (some 10-15%) were not prepared to take on the responsibilities of self-directed learning and, thus, encountered difficulties with ESC's educational program which requires a fair amount of student independence.

The data on reasons for withdrawing from ESC also contrasts rather sharply with several previous studies. Iffert (1965), in a national study, found academic problems (45.8%) as the primary reason for dropping out followed by health and family (25.2%), financial (15%), and dissatisfactions with the institution (6.1%). Fenstemacher's (1972) research on dropouts in the Minnesota State College System found the top four reasons for withdrawal as: insufficient financial resources (48%); disappointed with academic program (48%); unhappy with the college experience (47%), and academic program not available (38%). In a national survey by Panos and Astin (1969), the top four reasons for leaving were: dissatisfied with college environment (27%); for females, marriage (29%); wanted time to reconsider interests and goals (26%); financial (24%); and changed career plans (22%). In a more recent national study, Astin (1972) found that dropouts were more likely to be employed during the school year, more likely to be married or plan to marry while in college and more likely to be concerned about financing college education.

Figure 4

EFFECTS OF EDUCATIONAL EXPERIENCE AT ESC
EMPIRE STATE COLLEGE ATTRITION STUDY

Effect Category	Percent*
For the work I did, I learned a lot (increased intellectual competence)	40
I gained new insight into myself (self-understanding)	32
ESC generally positive experience (I think I would have done well if [illegible] for personal or financial problems)	21
I increased my self-confidence	16
I got to know my limitations	15
ESC helped me to clarify my life purposes	15
No effect whatsoever	12
I'm disappointed that I did not complete my studies	10
It was a completely negative experience	2
ESC enabled me to gain college credits, credit for life experience and eventually a degree	2
Helped to improve my job competence	2
It got my desire for a college education out of my system	1
Other	5

*Percentages total to more than 100 since many respondents identified more than one effect from their experience. The percentages were calculated on the basis of the number of responses for each effect category.

Comparing the reasons stated by ESC dropouts with those stated by the more traditional college age student suggests again that the ESC student is indeed different. Because ESC students are older, and at a different stage in their life cycle, family obligations or ill health appear to be either more likely or more pressing. Thus personal problems, job problems, and financial problems are three of the top four reasons at ESC for withdrawal that are not supported in most other studies reviewed.

One question in the phone interview asked each leaver with whom he/she discussed the decision to withdraw. About a quarter of the dropouts said they discussed the decision with no one, while over half (57%) talked with their mentor and 22% talked with their spouse. When the leavers were asked what the reactions were from the people with whom the decision to withdraw was discussed, over three-quarters stated that mentors, spouses, and others supported the decision to withdraw. This high percentage of support for decision to withdraw conflicts again with another study where only [illegible]0% of the individuals counseled the potential dropout to leave (Hannah, 1969, p. 399).

Effects of ESC Experience

A particular concern of this office in the cost/effectiveness study is with perceived effects of the ESC experience. Figure 4 presents data on leaver perceptions of effects of the educational experience upon them. Increased level of knowledge and intellectual competence was noted by 40%. Another third reported gaining insight into themselves and enhanced their self-understanding. One-fifth replied that ESC was a positive experience and would probably have graduated if it were not for personal or financial problems that interfered. Twelve percent said there was no effect whatsoever and 2% indicated their ESC experience was completely negative.

When these specific findings are grouped according to the stated cognitive and affective objectives of the College, it is clear that the leavers identify with the affective side. The categories of self-understanding, clarifying purposes, increasing self-confidence, and knowing my limitations account for 78% of the responses. On the other hand, intellectual and job competence accounted for 42% of the responses. It seems clear that leavers attained considerable cognitive and developmental growth from their stay at the college, while few dropouts reported no effects or negative effects. One final question asked how the leavers now view ESC. Fifty-three percent said that all things considered they viewed ESC in a very favorable light, 36% were generally favorable, 4% were neutral, 5% were generally unfavorable, and 1% were very unfavorable. Thus, about 10% of the dropouts were neutral or unfavorable in their view of the College after they had been withdrawn for eight months or more.

Suggestions for Improvement

When asked what ESC could do differently to prevent students from withdrawing, the leavers stated that increasing student-mentor dialogue, making mentors more accessible and providing better mentor guidance and advising (35%) were first priority. Secondly, the dropouts recommended simplifying the assessment process and making it the first activity for the student after he enrolls (19%): "I was left high and dry when I got to assessment. I never figured out what to do." Third, the leavers felt that bureaucratic "red tape" should be lessened (13%), while providing greater access to learning centers and learning resources was fourth (12%). About eight percent said that the college needed to provide more group studies and residencies. Finally, increasing financial aid was a concern of about five percent of the dropouts.

Policy Implications for Educators and Administrators

The remainder of this paper takes two illustrative findings and spells out certain policy implications using a multiple perspectives strategy. A multiple perspectives strategy suggests that a given finding may mean different things to different internal and external constituencies and, as a result, may propagate several lines of corrective action.

The first finding discussed is that 21% of the leavers identified poor student-mentor relationships as a major cause of their withdrawal. From the student's point of view, a poor relationship with a mentor cripples a primary reason for attending ESC—individualized attention. Because the student-mentor relationship is crucial to the successful completion of an individualized program like ESC's, students finding themselves in an unsatisfying or unproductive relationship cannot fall back on more traditional campus supports (other faculty, peer groups, extra-curricular activities, etc.) and, therefore, face a choice of stepping out or staying in an unpleasant situation. From a faculty point of view, attrition is often discussed as a quality control issue. At ESC mentors might argue that not all students are ready for or prepared to handle independent study. Therefore, dependent students may expect to be hand fed by their mentors and, when this does not happen, find the relationship unsatisfactory. Faculty frequently say the intensive face-to-face interaction with four or five students every day burns them out and, thus, may subtly encourage more dependent students to consider leaving the college. From another point of view, the student-mentor relationship problems resulted in two administrative recommendations in the recent institutional self-study (ESC Self-Study, 1974): the College should promote procedures that make change of mentors easier for students and should provide educational and career counseling beyond that now provided by mentors.

Multiple perspectives of the leaver profile—younger than most, single, lower status occupation, working full time, part-time student—are also possible. The admissions office might be alert to such characteristics in potential enrollees (especially since the basic admission criterion is the apparent ability to do ESC work). Faculty mentors might look at this profile and be prepared to provide relatively more counsel and direction for such people. The Office of Research and Evaluation might monitor these characteristics of incoming students to determine changes in the mix of the student body which might affect faculty work load, achievement of enrollment projections, number of tuition refunds, etc. Students who fit the profile might be more cautions about enrolling or more resolute afterward. Administrators may want to develop mechanisms for helping such students meet their academic obligations. For example, they might identify a consultant to assist at a workshop for faculty on counseling potential dropouts. State budget officials may want to review funding formulae since Empire is charged with serving such nontraditional students. Thus, the policy consequence of a finding depends upon the perspective of the viewer.

Final Observations

This paper disclosed the initial findings in a long-term attrition study that is part of the comprehensive cost/effectiveness research being conducted at Empire State College. The data show that Empire leavers are unlike dropouts studied in attrition studies at traditional colleges. Since ESC attracts students who are on the average older, married, working full time, and in another part of the life cycle, there is little surprise that its leavers have different demographic characteristics and report different reasons for leaving from traditional dropouts. Only preliminary studies of the non-traditional body at the Open University show similar findings. As other institutions take steps to serve large numbers of older students in flexible ways, the methodology and findings reported here should prove of interest.

Several important questions remain for future study. For example, what percentage of the leavers who work full time were also attempting to handle full time study? Were these the ones who did not complete learning contracts? What characterizes the students who dropped out after completing several contracts? Will factor or discriminant analysis techniques provide a clearer dropout profile? How will the Empire profile compare with that of other institutions, both traditional and nontraditional, that will be replicating the ESC methodology? A major report on attrition has been prepared by the Office of Research and Evaluation.

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[1] President Thaddeus Seymour of Wabash College in a talk to institutional research directors of the Great Lakes Colleges Association in 1970 used as his theme: "Institutional research can be vital if it avoids studies that are 'merely interesting' and not 'vital' to better-informed decision-making."

[2] These features are discussed more fully in previous AIR papers (Bradley & Palola, 1973; Bradley, 1974) and in other documents listed in the references.

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STATISTICAL COMPARISON OF ENTRANCE PREDICTION EQUATIONS USING ACT OR SAT SCORES OR BOTH

H. Bruce Higley, Larry L. Adams, and Leland H. Campbell
Brigham Young University

In the summer of 1970, the Office of Institutional Research at Brigham Young University (BYU) conducted a survey of selected universities across the nation to determine what research had been done on American College Test (ACT) scores versus Scholastic Aptitude Test (SAT) scores as predictors of college grade point averages. Many responded that they were unaware of such studies, but were interested in knowing which of these scores provides the more optimal equation for their particular institution. The few studies that were reported dealt with questions concerning correlations but not directly with techniques which provide optimal equations. Correlations measure relationships of variables but do not account for overlap between variables when there is more than one independent variable in the equation. One procedure to determine the variables which provide the optimal equation is to examine all variables under consideration in a stepwise regression analysis, which does account for overlap between the standardized test scores and high school GPA.

Purpose of the Study

The present statistical study was conducted to determine which of the two types of standardized scores, ACT or SAT, provides the more optimal equation for predicting first semester grade point averages (GPA) for beginning freshmen at BYU when used with high school GPA (HSGPA) as a fixed independent variable. A related purpose was to determine the extent to which either one of the standardized scores could be substituted for the other in a prediction equation.

Comparisons were also made to select the optimal variables from among the various ACT and SAT scores and types of high school GPA. Other comparisons were made according to sex to determine if separate equations were warranted for male and female students. Finally, comparisons were made to determine the degree of variation according to geographic area.

Sample Population

The sample consisted of 1,080 BYU students from 46 states, who were beginning freshmen during Fall semesters of 1969 through 1971, who were U. S. citizens, who were graduates of U. S. high schools, and for whom both ACT and SAT scores were available. The United States was divided into eight different regions for convenience of analysis by geographic area. A percentage distribution of the 1969 sample for Mountain states, Pacific states, and a combined group consisting of all other states was compiled. The majority (47.1%) of students in the ACT-SAT sample came from the Pacific states, whereas the majority (58.3%) of beginning freshmen at BYU came from the Mountain states. Thus, the Pacific states were more predominantly represented in this sample than in the general freshman population at BYU.

Methodology

The computerized statistical routines used to select and analyze the best sets of variables for a given group of students to provide the optimal prediction equation were the Texas Regression Analysis (TEXREG), Stepwise Regression Analysis (STEPREG), and the Goodnite Regression Analysis (GOODNITE). Both TEXREG and STEPREG are stepwise regression routines. TEXREG selected the best set of a given number of variables from all variables examined to provide the optimal equation. STEPREG selected the best variable to be added at each step in relation to the variables previously selected. Although STEPREG did not select the best given set as did TEXREG, it did provide information as to the relative position of each variable. The GOODNITE is a multiple regression analysis and was used to provide the mean square error and R^2 value from a specific prediction equation for a specific sample to compare with the mean square error and R^2 values for equations from the TEXREG and STEPREG routines. Although an R value is often reported in some literature, the R^2 value more directly identifies the amount of explained variation in the dependent variable.

The relative contribution of ACT and SAT scores to the prediction equation was examined by placing these scores, and all other variables under consideration, in the statistical model for each of these computerized routines. Statistical differences between prediction equations were tested using the F ratio based on the mean square error for each equation where the samples were independent. After consideration of the variables examined, available samples, and utilization of the results, the level of significance was set at 0.10 for this study. Research at BYU has indicated that the variables which provide an optimal prediction equation for students one year are not always the same variables which provide an optimal equation for another year.

Selection of Optimal Predictors

The objective in this phase of the study was to identify variables which tended to be consistent from year to year in providing the optimal equation and to determine the degree to which the use of other variables in the prediction equation affected the predictability. In this analysis, the stepwise regression routines examined the following variables: five ACT scores, two SAT scores and derived SAT composite, and nine different types of high school GPA. The variables which appeared to be the most consistent from year to year and group to group were: HSGPA total; SAT verbal; HSGPA core, which was calculated from the basic academic high school courses; high school English GPA; ACT composite; ACT math; and, to a limited extent, ACT social sciences and high school physical science GPA. Although these variables were considered to be the most stable, their consistency in contributing significantly to the prediction equation varied from year to year. In Table 1, for example, variable #7, high school GPA total, was the only variable that occurred more than once in the first three steps for these three years. In general, once an ACT score is selected for the equation, SAT scores are not included among the remaining significant variables; and conversely, once an SAT score is selected, ACT scores are not included among the remaining significant variables. Thus, it appeared that neither of these two standardized scores contained any significant amount of predictive ability above and beyond the other in predicting first semester GPA.

Exceptions that sometimes occur can be seen in Table 2. The best four variables for the 1969 male group were types of high school GPA. Neither ACT nor SAT scores entered the equation since neither contributed significantly to information already available from high school grades. Another exception is illustrated by the best four variables selected for the 1969 female group which included one SAT score and two ACT scores. The *t* value used in this table, although based on the general principle of the *t* test, is merely a test to determine if the amount which a variable contributes to the predictive ability of an equation is significant.

It appears from these results that variables which provide the best prediction equation for a given group may not provide the best prediction equation for a different group.

Variables which seemed to be most consistent from group to group were next analyzed. The independent variables used in the six equations analyzed in Table 3 are listed in the footnote of the table. Although there was considerable variation in the mean square error when applying any of these formulas to groups of students in succeeding years, there was little or no variation in the mean square error for the different formulas applied to students during the same year. This indicated that for the groups examined here, either ACT or SAT scores in conjunction with an HSGPA, would predict equally well.

ACT Versus SAT Scores as Predictors

Since stepwise regression routines sometimes selected ACT scores and other times SAT scores for the optimal equation, depending upon the group being analyzed, the next step was to compare the equations using ACT scores with those using SAT scores for each given group. For this analysis, the variables submitted to the TEXREG routine included total high school GPA and either ACT scores or SAT scores. Table 4 shows that there was little or no difference between the R^2 values for the equations using ACT and those using SAT for either the male or female groups. There was a slight difference of .04 between the R^2 values of the same two equations when applied to the combined male and female group. Since these

Table 1

VARIABLES* AND ORDER OF ENTRY FOR THE FIRST SEVEN STEPS OF THE STEPREG STATISTICAL ROUTINE FOR EACH OF THREE GROUPS EXAMINED

N	Group	Variable Entered at Given Step (F for Entering = 1.00) *						
		Step 1	2	3	4	5	6	7
282	1971	7	3	10	8	11	5	12
205	1970	6	2	8	12	1	9	14
332	1969	7	15	11	6	13	9	8

*ACT and SAT scores and high school grade point averages (HSGPA) as follows:

1. ACT English
2. ACT math
3. ACT social science
4. ACT composite
5. HSGPA core
6. HSGPA total
7. HSGPA English
8. HSGPA math
9. HSGPA social science
10. HSGPA biological science
11. HSGPA physical science
12. HSGPA electives
13. HSGPA foreign languages
14. SAT verbal

Table 2

R^2 VALUE FROM THE TEXREG ROUTINE FOR THE BEST FOUR AND BEST THREE VARIABLES AND T VALUE PER VARIABLE FOR SELECTED GROUPS OF THE 1969 ACT-SAT SAMPLE

Group	N	Variable and t Value				R^2
Male 69	187	All Fourteen Variables				.53
4 Best		HSGPA core	HSGPA elect	HSGPA bio. sci.	HSGPA total	.49
t Value		4.3	3.6	− 2.6	− 2.7	
Female 69	145	All Fourteen Variables				.42
4 Best		HSGPA total	ACT comp.	SAT verbal	ACT soc. sci.	.40
t Value		4.7	2.7	− 2.3	− 2.3	

equations were applied to the same groups, the R² values shown for the male groups and the female groups could lead one to assume that separate prediction equations are needed according to sex. The next phase of the study, therefore, dealt with this concern.

Analysis According to Sex

It is evident from Table 5 that the mean square errors for the combined (c) equation are equal to or less than the mean square errors for the equations by sex (F or M). For example, the error term for the C-70 SAT equation applied to the female 71 group was 0.28 compared to the error term for the F-70 SAT equation also applied to the female 71 group of 0.28; and the C-70 SAT equation applied to the male 71 group was 0.33 compared to the error term for the M-70 SAT equation also applied to the male 71 group of 0.33. The variation as measured by the error term was greater between years for a given equation than it was between different equations for the same year. For example, when the F-69 SAT equation was applied to females entering in 1970, the R² value was. 48, but when the same equation was applied to females entering in 1971, the R² value dropped to .24. When the C-69 and C-70 equations were applied to the same year (females entering in 1971), the difference in the R² values was only .02. Table 5 shows that an equation calculated from the combined group was more stable from year to year than one calculated for a specific group according to sex.

There was little difference in error terms between comparable ACT and SAT equations when applied to the same group. Note, for example, the F-69 equations applied to the 1970 female group and the M-69 equations applied to the 1970 male group.

Geographic Variations

In considering variations which occur from group to group, statistical results were analyzed for ACT and SAT

Table 3

R² AND MEAN SQUARE ERROR (MSE) VALUES FOR CERTAIN OPTIMAL-VARIABLE EQUATIONS* AND MSE FROM APPLYING EACH EQUATION TO DATA FROM STUDENT SAMPLES FOR SUCCEEDING YEARS

	Equation 69			Equation 71			Equation 70		
Data	No.	R^2	MSE	No.	R^2	MSE	No.	R^2	MSE
ACT-SAT 69	1	.40	.26						
(N= 332)	2	.39	.26						
	3	.40	.26						
	4	.43	.25						
	5	.42	.25						
	6	.41	.25						
ACT-SAT 70	1		.36	1	.40	.35			
(N= 401)	2		.36	2	.40	.35			
	3		.36	3	.41	.35			
	4		.36	4	.41	.35			
	5		.36	5	.41	.35			
	6		.36	6	.41	.35			
ACT-SAT 71	1		.29	1		.30	1	.35	.29
(N= 522)	2		.29	2		.31	2	.34	.29
	3		.29	3		.30	3	.35	.29
	4		.28	4		.30	4	.37	.28
	5		.28	5		.30	5	.37	.28
	6		.29	6		.30	6	.36	.29

*Equations:

1. HSGPA - core and SAT composite
2. HSGPA - core and ACT composite
3. HSGPA - core and HSGPA electives and ACT math
4. HSGPA - core and HSGPA electives and SAT verbal
5. HSGPA - core and HSGPA electives and SAT composite
6. HSGPA - HSGPA electives and ACT composite

Table 4

R² VALUES FROM TEXREG ROUTINE ACCORDING TO THE BEST FOUR, THREE, AND TWO VARIABLES SELECTED FOR USE IN ACT OR SAT EQUATIONS[a] WITH FIRST SEMESTER GPA AS THE DEPENDENT VARIABLE

		HSGPA Total[b] with ACT		HSGPA Total[b] with SAT	
	N	ACT Variables	R^2	SAT Variables	R^2
Male 1970	135				
4 Best		Eng., math, comp.	.47	verbal, math, comp.[c]	.47
3 Best		Eng., math	.47	verbal, comp.	.47
2 Best		math	.47	verbal	.47
Female 1970	70				
4 Best		Eng., math, comp.	.33	verbal, math, comp.	.32
3 Best		Eng., math	.33	verbal, comp.	.32
2 Best		math	.32	verbal	.32
Comb. 1970	205				
4 Best		Eng., math, comp.	.42	verbal, math, comp.	.46
3 Best		math, comp.	.42	verbal, comp.	.46
2 Best		math	.42	math	.46

[a] TEXREG examined five ACT (or three SAT) scores and total high school grade point average (HSGPAT) as independent variables
[b] HSGPA total was selected by TEXREG in each case for these groups
[c] Calculated composite score

Table 5

MEAN SQUARE ERROR (MSE) COMPARISONS FOR REGRESSION EQUATIONS USING ACT COMPOSITE SCORES AND HIGH SCHOOL GPA WITH THOSE USING SAT COMPOSITE SCORES AND HIGH SCHOOL GPA FOR PREDICTING FIRST SEMESTER GPA OF MALE AND FEMALE BEGINNING FRESHMEN AT BYU, FALL SEMESTER OF 1970 AND 1971

Group to Which the Equation was Applied	Equation Applied*	Mean Square Error SAT Equation	Mean Square Error ACT Equation	Group to which the Equation was Applied	Equation Applied*	Mean Square Error SAT Equation	Mean Square Error ACT Equation
Female 70	F-69	.48	.47	Male 70	M-69	.36	.36
	C-69	.34	.34		C-69	.36	.35
Female 71	F-69	.24	.25	Male 71	M-69	.31	.31
	C-69	.24	.24		C-69	.30	.31
	F-70	.28	.29		M-70	[illegible]	.34
	C-70	.26	.27		C-70	.33	.33

*Symbols designate the group from which the particular equation was developed, e.g., F-69 is the group of female beginning freshmen for Fall semester 1969; C-70 is the group of females and the males combined who were beginning freshmen Fall semester of 1970.

equations according to geographic area. The eight geographic areas of the United States are listed in Table 6, together with the mean square error values of the ACT and SAT equations derived for each area. Also included is an E ratio, which is similar to an F ratio, and serves as a means of comparing the ACT and SAT equations for each area. This E ratio was not used in the normal sense of an F test since the mean square error values are not independent; instead it was used to compare the degree of fit of the ACT equation with the degree of fit of the SAT equation.

Sub-samples from two different years were combined to obtain a group large enough to allow the areas with very small numbers of students to be analyzed. In spite of this effort, there were fewer than 20 students in both the New England States, and D. C. and Adjoining States; thus, these two areas were not included in this analysis. The E ratios indicate that there was little or no difference between the mean square errors of the ACT and SAT equations for each area since they were all close to 1.00. Although there was little difference between the results when using ACT and SAT equations for each geographic area, there were differences for specific equations between geographic areas.

Since the error terms from two independent samples were being compared, the F ratio as a test of significance was appropriate. An F ratio was obtained by dividing the mean square error of a given prediction equation for a specific geographic area shown in Table 6 by the mean square error of a given prediction equation for another geographic area and comparing that F ratio to a critical F value. The geographic areas for which the F ratios were significant were Pacific versus Mountain, Great Lakes versus Pacific, Great Lakes versus Mountain, and Mid-Atlantic versus Mountain. None of the other area comparisons were significant. Further research could tend to show the advisability of developing separate prediction equations for certain geographic areas.

Table 6

MEAN SQUARE ERROR (MSE) AND E RATIO FOR ACT EQUATIONS[a] AND SAT EQUATIONS[a] ACCORDING TO GEOGRAPHIC AREA FOR TWO-YEAR SAMPLES OF BYU BEGINNING FRESHMEN

Data	N	ACT Equations MSE	SAT Equations MSE	E Ratio[b] for ACT & SAT
New Eng. 70 & 71		Sample less than 20		
DC & Adj 70 & 71		Sample less than 20		
Great Lakes 70 & 71	26	.45	.44	1.02
Mid Atl 70 & 71	30	.41	.42	1.02
South 70 & 71	38	.32	.30	1.07
Central 70 & 71	46	.30	.29	1.03
Mountain 70 & 71	182	.23	.23	1.00
Pacific 70 & 71	382	.31	.31	1.00

[a] ACT (or SAT) composite score and high school total GPA as independent variables and BYU first semester GPA as the dependent variable

[b] Ratio of MSE for ACT equation and SAT equation

Summary and Discussion

There was little or no difference when either SAT or ACT scores were used for predicting first semester GPA for beginning freshmen at BYU when high school total GPA was used as one of the independent variables. There were slightly greater differences between male and female groups, and even larger differences between succeeding years. In most cases, regression equations obtained from combined groups of male and female students were more stable than separate equations for each sex when applied to samples for succeeding years. There was little or no difference between the results when using ACT or SAT equations for each geographic area, but there were significant differences for separate prediction equations for certain geographic areas.

One additional consideration in this type of research is the fact that SAT scores converted to ACT equivalents are sometimes substituted in the prediction equation constructed for use of ACT scores and vice versa. The danger in such a substitution is the compounding of error. The correlation between ACT or SAT scores and first semester GPA is very low, or in other words, the prediction error is high. There is also error in estimating equivalent ACT scores from SAT scores. Hence, the use of converted SAT scores in an equation for ACT scores merely compounds error in predicting first semester GPA. However, the maximum error compounded by using SAT equivalent scores in an equation for ACT scores can be no larger than the amount that the R^2 value will be increased by adding the ACT variable to high school GPA for prediction. Research at a given institution may show the maximum error to be small enough that the cost of using separate formulas may not be warranted. Although previous studies have indicated that ACT and SAT scores contribute more to the prediction equation than other types of variables usually examined, excluding high school GPA, these two standardized scores added a maximum of only 0.02 to the R^2 value of the prediction equation at BYU. This may partly explain why no significant differences were found between the equations using ACT scores and those using SAT scores. It should be emphasized, however, that ACT or SAT scores can often serve as stabilizing variables in prediction equations; and this consideration alone may justify their use.

Some administrative decisions may need to be made in light of the following considerations:

1) The cost of an additional examination could be burdensome to some students if they were required to take ACT, for example, when many of them may already have taken SAT.

2) The cost of conducting a second continuing research program to produce equations for an additional standardized test to be used for predictions may not be warranted.

3) The cost of modifying computer systems to store and use the scores of more than one set of standardized tests may not be warranted.

4) The various predictive uses that are made of standardized tests by individual schools, such as admission to honors programs or to specific majors, may influence the selection of standardized tests to be used.

ACT and SAT scores have been shown to predict equally well at Brigham Young University. It is recommended, however, that similar research be conducted by any school desiring to build prediction equations using the procedures outlined in this presentation as a model. This analysis should be adapted to the specific characteristics of the students and needs of the particular institution.

A LONGITUDINAL STUDY OF ASSOCIATE DEGREE GRADUATES: A MECHANISM FOR PROGRAM ASSESSMENT

Edward Mann, Pennsylvania State University

Two of the major issues facing education today are *relevance* and *results.* Whether we acknowledge it or not, our society expects our schools and colleges to equip young men and women for successful entry into the world of work (*Kappan,* 1973). An important mechanism for ascertaining how graduates of associate degree programs are doing in this "world of work" is the follow-up study. Educators who teach or administer vocational/technical associate degree programs have been concerned, from the time such curricula have been initiated, with the performance of their graduates. A basic consideration has to do with whether the special education and skill training provided via an associate degree program significantly affects the graduates as individuals in society and as paraprofessional specialists. While the former concern is most difficult to determine, the latter, because it includes skill development within its rubric, does offer some measurable components.

Follow-up studies where the modus operandi is to observe students after they leave the educational scene are a variety of ex post facto empirical research. Such studies are considered to be a component of program and institutional evaluation. This research of the associate degree graduate is perhaps even more imperative than that of the four year graduate, since the two year programs must be especially sensitive to all sociological and technical changes if they are to meet the needs of business and industry and at once satisfy the requirements of students with a broad range of interests, aspirations, and abilities.

Follow-up, therefore, is an indispensable aid to vitality, efficiency, and productivity of the institution. The findings, if accurately derived, translated, and applied, can provide information that is of great value in the program and policy making decisions of institutions concerning curriculum. And since the curriculum is the vehicle through which the institution seeks to make its most significant impact on the lives of students, the establishment, operation, and evaluation of the curriculum ought to be of utmost importance.

Procedure

The third phase of a longitudinal study of The Pennsylvania State University Associate Degree Graduates was conducted during the 1974-75 academic year. Phase I of the study was designed in 1969 and conducted in 1970, followed by Phase II of the study in 1972-73.

A random sample consisting of associate degree graduates for each year of graduation between 1955 and 1974 and covering 23 curricula were included in the study. These Phase III participants were surveyed by a questionnaire which included items in the following categories:

(1) Demographic information
(2) Curricular relevancy and overall value of their associate degree program
(3) Job mobility
(4) Perceptions of present job
(5) Job satisfaction characteristics

The response rate was 66.8% or 501 returns of the 750 graduates sampled.

Results

A generalized profile of associate degree graduates shows that:

Percent of the Graduates	
1.0%	Never held a full-time job since earning the associate degree and are not currently full-time students
6.7%	Full-time students (of that number 9% are working part-time)
85.7%	Working full-time (of that number 13.4% are part-time students)
0.6%	In the military full-time
5.6%	Currently unemployed

The mean beginning salary adjusted on the purchasing power of the dollar base year 1967 (U.S. Department of Labor, Bureau of Labor Statistics) was $466.23/month with 43.9% reporting a starting salary over $500/month. The mean present salary was $1036.18 per month with 47.2% reporting a present salary over $1000/month and .73% reporting a present salary over $3000/month.

The mean number of employer changes was 1.26 with only 7.9% having more than three employer changes. The mean number of job changes was 1.53 with 12.8% having more than three job changes.

In describing their present job using the four core dimensions (Hackman & Lawler, 1971)—variety, autonomy, task identity, and feedback—along with an interpersonal dimension, the graduates reported that their present job has over a moderate amount of variety (3.5 on a 1-5 scale with 1 being not at all descriptive of their present job to 5 which is completely descriptive of their present job), over a moderate amount of autonomy (3.5), and over a moderate amount of task identity (3.4). They also reported a moderate amount of feedback (3.0) and interpersonal relations (3.1).

To obtain a measure of the degree to which the associate degree graduates were desirous of obtaining higher order need satisfactions from their present jobs, 12 items were included which asked how much of various opportunities and attributes the employees would desire to have on their job. Scores of each employee on the 12 items were summed to obtain an overall measure of the level of higher order need strength. The internal consistency reliability of the 12-item scale was .89 (Hackman & Lawler, 1971). Overall, the associate degree graduates reported that they would like to have a substantial amount (3.9) of the various opportunities and attributes which measure this higher order need strength.

Assessment was also made of the satisfaction of the associate degree graduates on ten characteristics of job satisfaction along with a general job satisfaction question. The graduates reported that they were *less than moderately* satisfied with the chance for advancement on their present job (2.8 on a 1-5 scale with 1 being unsatisfied and 5 being completely satisfied), *moderately* satisfied with their ability utilization (3.2) and compensation (3.2); *more than moderately* satisfied with the variety (3.5), the independence (3.5), the responsibility (3.4), the creativity (3.3), the achievement (3.3), and the activities (3.3) on their present job; and *highly* satisfied with the security aspects (3.8) of their present job. Overall, when asked the question, "how satisfied are you with your job?" the associate degree graduates reported that they were more than moderately satisfied (3.3).

When asked to rank the importance of their work with various other aspects of their lives, the graduates reported their work is among the most important aspects with 10.5% ranking it as the most important aspect of their lives.

The final section of the questionnaire dealt with the graduates' assessment of various components of the associate degree program. When asked the extent of utilization of these various components on their present job, the graduates reported that the specialty courses, which were defined as courses in their major, were of some use on their present job (3.2 on a 1-5 scale with 1 being of no use to 5 being of very much use); the supportive courses, courses related to their major, were also rated as of some use (3.0); along with the general education requirements being of some use (2.9). The overall rating of the utilization of the associate degree components on their present job was of some use (3.0).

When asked to rank order the three program components along with extra-curricular activities and out of school activities on a 1-5 scale with 1 being the most important to 5 being the least important, specialty courses were ranked first with a 2.0 mean ranking, supportive courses were second with a 2.5 mean ranking, general education requirements were third with a 2.8 mean ranking, general education requirements were third with a 2.8 mean ranking, out of school activities were ranked fourth with a 3.9 mean ranking, with extra-curricular activities ranked last with a 4.0 mean ranking.

The graduates were also asked to what extent the instructors of their associate degree program provided them with an accurate picture of their abilities to perform and a picture of the job market in their chosen occupation. The results show that the instructors provided some (3.0) picture of their abilities to perform in their chosen occupation and slightly less than some (2.9) picture of the job market in their chosen occupation.

The utilization of a statistical technique, multiple regression analysis, enabled us to make the following statements concerning program utilization, job satisfaction, and the demographic characteristics:

1. On the average, those who graduated from the earlier associate degree programs:
   a. have the higher present salaries.
   b. have the least amount of previous full-time work experience.
   c. were provided with the least accurate picture of their abilities to perform in their chosen occupation.
   d. had the most employer changes.
   e. had the most job changes.
   f. have a higher satisfaction with the way their job provides for steady employment.
   g. are less satisfied with the pay and the amount of work they do.
   (explains 52% of the variance)
2. On the average, the older associate degree graduates:
   a. have the higher present salaries.
   b. had the least amount of previous full-time work experience.
   c. are less satisfied with the amount of variety on their present job.
   (explains 46% of the variance)
3. On the average, the associate degree graduates with the highest present salary:
   a. are the earlier graduates.
   b. are the older graduates.
   c. have had less employer changes.
   d. have had more job changes.
   e. are more satisfied with the activity, the security, and the compensation on their present job.
   f. are less satisfied with their ability utilization on their present job.
   g. are higher in the higher order need strengths.
   (explains [illegible]% of the variance)
4. On the average, those graduates with the higher amount of previous full-time work experience:
   a. are the later associate degree graduates.
   b. are the younger associate degree graduates.
   c. had a higher beginning salary.
   d. are more satisfied with the variety on their present job.
   (explains 11% of the variance)
5. On the average, those graduates with the higher beginning salaries:
   a. have the higher present salaries.
   b. had the most previous full-time work experience.
   c. were provided with a more accurate picture of the job market for their chosen occupation.
   d. had the most job changes.
   e. are more satisfied with the creativity and the security aspects of their present job.
   f. are generally *less satisfied* with their present job.
   g. give a lower ranking to the supportive courses of the associate degree program.
   h. give a lower ranking to the extra-curricular activities of the associate degree program.
   i. have less task identity on their present job.
   j. have a higher total utilization for their associate degree program.
   (explains 18% of the variance)
6. On the average, the graduates who rank their work highest as compared to the other aspects of their lives:
   a. are generally more satisfied with their present jobs.
   b. rank the general education requirements as lower for their associate degree program.
   c. rank the total associate degree utilization as high.
   (explains 7% of the variance)

7. On the average, the graduates whose instructors provided them with the most accurate picture of their abilities to perform in their chosen occupation:
   a. are the later associate degree graduates.
   b. also were provided with a more accurate picture of the job market.
   c. are more satisfied with their present job.
   (explains 34% of the variance)
8. On the average, the graduates whose instructors provided them with the most accurate picture of the job market for their chosen occupation:
   a. had higher beginning salaries.
   b. also were provided with a more accurate picture of their abilities.
   c. ranked their specialty courses lower.
   d. ranked their supportive courses higher.
   e. described their present job as having more variety.
   f. ranked the total associate degree utilization as high.
   (explains 32% of the variance)
9. On the average, the graduates with the most employer changes:
   a. are the earlier graduates.
   b. have a lower present salary.
   c. had the most job changes.
   d. are less satisfied with the ability utilization on their present job.
   e. are more satisfied with their pay and the work they do.
   f. are generally less satisfied with their present job.
   g. utilize the supportive courses from their associate degree the least.
   h. ranked the specialty courses lower.
   (explains 36% of the variance)
10. On the average, the graduates with the most job changes:
    a. are the later associate degree graduates.
    b. have a higher present salary.
    c. had a higher starting salary.
    d. had more employer changes.
    e. are generally more satisfied with their present job.
    f. utilize their supportive courses more on their present job.
    g. rank the specialty courses lower.
    h. describe their present job as having a high amount of inter-personal relations.
    i. are lower on higher order need stengths.
    (explains 40% of the variance)
11. On the average, the graduates who are most satisfied with the variety aspect of their present job:
    a. are the younger graduates.
    b. had more previous full-time work experience.
    c. are less satisfied with the independence, the creativity, the activities, the ability utilization, the security, and the compensation aspects of their present job.
    d. utilize their specialty courses more.
    e. rank their out of school activities lower.
    f. describe their job as having much task identity.
    g. have lower higher order needs strengths.
    (explains 85% of the variance)
12. On the average, the graduates who are most satisfied with the independence aspect of their present job:
    a. are less satisfied with the variety, the creativity, the activities, the ability utilization, the security, the compensation, and the advancement possibilities on their present job.
    b. are more satisfied with the responsibility aspect.
    c. rank the out of school activities as more important.
    d. describe their present job as having more variety, more interpersonal relations, and more task identity.
    e. have lower higher order need strengths.
    (explains 81% of the variance)
13. On the average, the graduates most satisfied with the responsibility aspect of their present job:
    a. are more satisfied with the independence aspects and the creativity.
    b. are less satisfied with the ability utilization and the compensation aspect of their present job.
    c. utilize their supportive courses more.
    d. describe their present job as having more variety, more interpersonal relations, and more task identity.
    e. are lower in higher order need strengths.
    (explains 89% of the variance)
14. On the average, the graduates most satisfied with the creativity aspect of their present job:
    a. had the higher beginning salaries.
    b. are less satisfied with variety, with independence, activity, ability utilization, security provided, and advancement possibilities of their present job.
    c. are more satisfied with the responsibility on their present job.
    d. are generally more satisfied on their present job.
    e. describe their present job as having less variety.
    f. describe their present job as having more interpersonal relations.
    g. describe their present job as having more task identity.
    (explains 88% of the variance)
15. On the average, the graduates who are more satisfied with the achievement on their present job:
    a. are less satisfied with the activities, the ability utilization of their present job, the security, and the compensation of their present job.
    b. utilize the supportive courses more on their present job.
    c. rank the support courses lower.
    d. describe their present job as having more interpersonal relations, more autonomy, more feedback, and more task identity.
    (explains 88% of the variance)
16. On the average, the graduates who are more satisfied with the activity on their present job:
    a. have higher present salaries.

b. are less satisfied with the variety, the independence, the creativity, the achievement, and the advancement possibilities on their present job.
c. utilize the supportive courses more on their present job.
d. describe their present job as having fewer interpersonal relations.
e. describe their present job as having more task identity.
f. have lower higher order need strengths.
(explains 78% of the variance)

17. On the average, the graduates who are more satisfied with their ability utilization on their present job:
a. have lower present salaries.
b. have made fewer employer changes.
c. are less satisfied with the variety, the independence, the responsibility, the creativity, the achievement, the activity, the compensation, and the advancement possibilities of their present job.
d. describe their present job as having fewer interpersonal relations, and more task identity.
e. utilize their associate degree more on their present job.
(explains 79% of the variance)

18. On the average, the graduates who are more satisfied with the security of their present job:
a. are earlier graduates.
b. have higher present salaries.
c. had higher beginning salaries.
d. are less satisfied with the variety, the independence, the creativity, the achievement, and the activity on their present job.
e. utilize their specialty courses more.
f. describe their job as having fewer interpersonal relations and more task identity.
(explains 80% of the variance)

19. On the average, the graduates who are more satisfied with their compensation (the pay for the amount of work they do) on their present job:
a. are later graduates.
b. have a higher present salary.
c. had more job changes.
d. are less satisfied with the variety, the independence, the responsibility, the achievement, the activity, and the ability utilization.
e. utilize the supportive courses more on their present job.
f. describe their present job as having fewer interpersonal relations and more task identity.
g. are lower on higher order need strengths.
(explains 80% of the variance)

20. On the average, the graduates who are more satisfied with the advancement possibilities on their present job:
a. are less satisfied with the independence, the responsibility, the activity, and the ability utilization on their present job.
b. describe their present job as having fewer interpersonal relations, more feedback, and more task identity.
c. are lower on higher order need strengths.
(explains 91% of the variance)

21. On the average, the graduates who are generally more satisfied with their present job:
a. had lower beginning salaries.
b. ranked their job as being of most importance.
c. had a more accurate picture of their abilities to perform as provided by their associate degree instructors.
d. had fewer employer changes.
e. had more job changes.
f. are more satisfied with the creativity on their present job.
g. utilize their specialty courses more on their present job.
h. utilize their supportive courses and general education requirements less on their present job.
i. rank their specialty courses, supportive courses, general education requirements, and extra-curricular activities lower.
j. describe their present job as having more feedback and less task identity.
k. have higher higher order need strengths.
(explains 83% of the variance)

22. On the average, the graduates who utilize their specialty courses more on their present job:
a. are more satisfied with the variety and the advancement possibilities on their present job.
b. are generally more satisfied with their present job.
c. utilize their general education requirements more.
d. rank the importance of the specialty courses higher.
e. rank the importance of their supportive courses and their extra-curricular activities lower.
f. describe their present job as having less task identity.
g. have higher higher order need strengths.
(explains 82% of the variance)

23. On the average, the graduates who utilize their supportive courses more on their present job:
a. had fewer employer changes.
b. had more job changes.
c. are more satisfied with the responsibility, the achievement, and the compensation on their present job.
d. are generally less satisfied on their present job.
e. utilize their general education requirements more on their present job.
f. rank their specialty courses lower and their supportive courses higher.
g. describe their present job as having less task identity.
h. have higher higher order need strengths.
(explains 73% of the variance)

24. On the average, the graduates who utilized their general education requirements more on their present job:
a. are generally less satisfied on their present job.
b. utilize their specialty and supportive courses more.
c. ranked their general education requirements higher.

d. had lower higher order need strengths.
(explains 58% of the variance)

25. On the average, the graduates who described their present job as being high in variety:
a. were provided with a more accurate picture of the job market by the associate degree instructors.
b. were less satisfied with the independence and the creativity on their present job.
c. were more satisfied with the responsibility on their present job.
d. described their present job as having more autonomy.
e. have higher higher order need strengths.
f. utilize their total associate degree program more.
(explains 78% of the variance)

26. On the average, the graduates who described their present job as being high in interpersonal relations:
a. had more job changes.
b. are more satisfied with the independence, responsibility, and creativity on their present job.
c. are less satisfied with the achievement, activity, ability, utilization, security, compensation, and advancement possibilities on their present job.
d. describe their present job as being high in autonomy, feedback, and task identity.
(explains 91% of the variance)

27. On the average, the graduates who described their present job as being high in autonomy:
a. are more satisfied with the achievement on their present job.
b. rank their general education requirements higher.
c. rank their out of school activities lower.
d. describe their present job as being higher in variety and interpersonal relations.
(explains 79% of the variance)

28. On the average, the graduates who described their present job as being high in feedback:
a. are more satisfied with the creativity and the advancement possibilities on their present job.
b. are generally more satisfied with their present job.
c. rank the general education requirements of the associate degree higher.
d. rank the out of school activities lower.
e. describe their present job as being high on interpersonal relations and task identity.
f. utilize the total associate degree less.
(explains 88% of the variance)

29. On the average, the graduates who described their present job as being high on task identity:
a. had lower beginning salaries.
b. are more satisfied with independence, responsibility, creativity, achievement, activity, ability utilization, security, compensation, and advancement possibilities on their present job.
c. are generally less satisfied on their present job.
d. utilize their specialty and supportive courses less on their present job.
e. describe their present job as being high on interpersonal relations and feedback.
f. have higher higher order need strengths.
(explains 99% of the variance)

30. On the average, the graduates higher on higher order need strengths:
a. have higher present salaries.
b. had more job changes.
c. are less satisfied with variety, independence, activity, security, and advancement possibilities on their present job.
d. are generally more satisfied on the present job.
e. utilize their specialty, supportive, and general education requirements more on their present job.
h. ranked their specialty courses, general education requirements and extra-curricular activities higher.
g. described their present job as being higher on variety and task identity.
h. utilize the total associate degree more.
(explains 92% of the variance)

31. On the average, the graduates who utilize the total associate degree program more:
a. had higher beginning salaries.
b. ranked their work as being lower in importance.
c. had a less accurate picture of the job market in their chosen occupation.
d. were more satisfied with the ability utilization on their present job.
e. ranked their supportive courses, general education requirements, and extra-curricular activities higher.
f. ranked their out of school activities lower.
g. described their present job as being high on autonomy and low on feedback.
h. are higher on higher order need strengths.

Conclusions

What do these findings mean in terms of curriculum development, instruction, and policy making? Knowing the type of activities the graduates engage in on the job ought to serve as a guide in choosing curricula for present students.

Faculty should consider incorporating the findings of such follow-up studies into their curriculum, teaching, and laboratory practices. It may call for special efforts such as seminars and workshops conducted by qualified individuals to enable the faculty to come together to decide how such findings can be best implemented. These feedback activities should be supported by institutional administrators and be integrated into each instructor's responsibility. In this way the translation from survey to curriculum can be completed.

The matter of job satisfaction ratings should be of great concern to educators. It may be the tip of a very large iceberg that has more to do with the state of the economy, but it may also express a certain malaise among recent graduates. Colleges and universities owe it to their students and to society to provide a high quality of education that will enhance one's chance of obtaining an attractive job. Associate degree program planners, therefore, should tailor program content and rate of admissions—along with student qualifications and interests—to the realities of the labor market. More expert and more frequent vocational counseling should be a part of the picture.

Future enrollment in associate degree programs should at least be partially based on state and federal manpower data. These sources are becoming increasingly sophisticated and usable for employment predictions on a state and regional basis. Continuing follow-up studies will reveal, to a substantial extent, the discrepancy between "what's out there" and what the graduates are trained for.

Follow-up studies can provide the information and impetus to keep programs, faculty, and graduates up-to-date in matters relating to the always changing world of work.

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STATEMENTS ON ETHICS AND VALUES IN INSTITUTIONAL RESEARCH: A SEMINAR

Joe L. Saupe, University of Missouri
Sidney Suslow, University of California, Berkeley
James W. Firnberg, Louisiana State University System
Warren W. Gulko, University of Massachusetts
Paul L. Dressel and Thomas M. Freeman, Michigan State University

Introduction—Joe L. Saupe

For the purpose of these statements we will say that institutional research is a function or set of activities which develops information to be drawn upon in the making of decisions about an institution of postsecondary education and in interpreting the institution to its several constituencies. Information relevant to policy and management decisions at all points of the goal-setting-planning-operation-evaluation cycle is included. The various dimensions and categories of institutional organization and activity—from formal and informal curricula, instruction, and learning to resource allocation and utilization—are all subjects of institutional research. Information intended for understanding and interpretation includes that provided external agencies on questionnaires and report forms and may have common elements with information for decision.

The term, information, is, at this point, left undefined; the nature of information that should emerge from institutional research constitutes an issue to be addressed in the statements.

The function or activity of institutional research is carried out by individuals. Let us assume these individuals are members of a profession of institutional research. Using this premise and the preceding description of institutional research, the issue to be addressed by the following statements is "what are the professional ethics or standards of institutional research?" Because the values of members of the profession, the values embodied in their work, and the values involved in the utilization of the products of their efforts are components or derivatives of the ethical standards of the profession, particular attention is paid to values.

While many of us might believe that institutional research does not now have the status of, or meet the requirements for constituting, a profession, it is nevertheless appropriate for us, from time to time, to reflect upon the ethical and value considerations involved in our work. If, someday, a code of professional ethics or standards is established for the field of institutional research, we could hope it would be found that these statements made a contribution to that development.

In this framework the following list of questions is offered as a further definition of the topic. These, and perhaps a few others like them, are the questions the authors have been asked to address in manners of their individual choosing.

1. For whom do we work or to whom should we feel accountable?
   - — the administration
   - — the faculty
   - — ourselves
   - — the college or university, in general
   - — other
2. What sorts of restraints are or should be accepted in our pursuit of the "truth"?
   - — any imposed by our boss
   - — any which lead us away from making our institution look bad
   - — those imposed by our own sets of values or biases about methodology, our institution, or higher education, in general
   - — other
3. To what or whom do we owe our loyalty?
   - — the tenets of institutional research
   - — our institutions
   - — our own conscience and integrity
   - — other
4. Can or should a distinction be made between institutional research and decision-making based thereon?
   - — yes, it must
   - — no, it cannot
   - — other
5. To whom should we reveal our findings?
   - — only those who asked the question or sought the information
   - — anyone affected or with a "need to know"
   - — anyone who asks
   - — anyone who might be interested
   - — other
6. What should we report?
   - — the facts, only
   - — the facts and their interpretation
   - — facts, interpretation, and implications
   - — facts, interpretation, implication, and recommendations
   - — all we know and believe
   - — other
7. What sorts of confidentiality should we observe?
   - — that which protects the privacy of individuals
   - — that which protects the privacy or autonomy of the institution
   - — that which protects our work from review
   - — other
8. Should we have an obligation to share our findings and methodologies with our colleagues in institutional research?
   - — yes
   - — no
   - — methodology, only
   - — other
9. Should we attempt to influence the manner in

which, and the values brought to bear as our information is employed in decision-making?
- we can only cite limitations to our work
- we should make explicit the value considerations involved
- we should actively encourage the decisions we see our data calling for
- other

10. What are the values that are brought to bear as decisions based upon information are made? Which are appropriate and which are not?
    - this is of no concern to us
    - other

Conflicting Roles of Academic Administrators and Institutional Researchers—Sidney Suslow

There is little in institutional research which calls for a unique set of ethics and values. At a minimum any set suitable for social scientists would suffice. At a maximum those ethics and values which govern humane and prudent men and women would cover the remainder. While complex guidelines could be drafted for institutional researchers, I would regard as misguided any attempt to establish rigid codes of behavior and narrow descriptions of the researchers, themselves. Our own experiences should tell us that ethical codes have not made soldiers praiseworthy, lawyers honest, or doctors humane.

We should feel loyal, therefore accountable, to (a) our consciences, (b) social good, (c) the aims of higher education, (d) the goals of our institutions, (e) students and staffs, and (f) our bosses. We should be confident of our information and be guided by our prudence in its interpretation and dissemination. The nature, intensity, and thoroughness of our responses should vary with our perceptions of their value to others and our perceptions of the efficacy of our own insights drawn from the data. No precise format can be established, but the more powerful the insight and the more specialized the knowledge, the more compelling it should be to extend the response to include interpretations, implications, and recommendations.

As I indicated, I find nothing unique in these questions of ethics or values for institutional researchers compared to other researchers; however, there is one question which, while not unique, concerns a dominant feature found in the role of institutional research and not in most other research to the same extent. I refer to the question of the distinction between institutional research and the decision-making process. In the remarks which follow you can substitute planner for administrator for their roles are almost identical. Administrators and planners make decisions and the roles they play conflict with the role of the institutional researcher.

Academic administrators and institutional researchers share interests in many of the same educational goals and they often use the same facts to achieve these goals. Administrators also share considerable interest in the methodologies researchers use to derive these facts. Underlying these and other common interests is a basic conflict between the role of the administrator and the role of the researcher. This conflict arises from perceived differences in which means achieve which ends. The conflict of roles does not imply a conflict between individuals or necessarily a conflict between personalities; however, since administrator and institutional researcher frequently occupy the same body, the conflict is not always antagonistic, but often schizophrenic. The disorder is not clinical. The separate roles serving different needs of higher education allow for functioning in an interdependent manner. Whether the conflict is endogenous and cannot be excised, or whether its occurrence is between two different persons, there is value in describing its pathology in order to understand and control it.

A partial listing of the uses of methodologies by administrator and researcher will provide some description of the problem. The administrator uses methodologies to convince others that the objectives sought are just and appropriate, to provide rational and empirical pathways to predetermined goals, to maintain or achieve relevancy, and to expedite the administrative process. The researcher uses methodologies to predict and illuminate, as catalysts to precipitate answers from questions, as tools for exploration, and as objects of relevance in themselves.

The administrator is pragmatic and teleological. Not only does he see a natural design in his plans, he does not hesitate to improve the natural processes with practical assistance. When he uses methodologies which yield satisfactory but slightly promiscuous results, the administrator retains the method but purifies the results. He is particularly delighted whenever a methodology yields propitious results, for then he can use the method not so much as a tool, but as a weapon. Methodologies which provide unwanted answers are rejected by the administrator as obstacles in the administrative process. These practical solutions, providing expedient means toward distant ends, may be viewed with concern by researchers but, if so, they are ignoring the potential schizophrenia which affects both roles.

The researcher is idealistic and credulous. When he is convinced his methodology is pure, he accepts the results regardless of their sense or relevance. A methodology may yield acceptable results, but the researcher feels compelled to continuously modify it in the hope the changes will yield even more acceptable results. When the researcher is convinced that a particular methodology reflects favorably on the quality of his scholarship, he will use it in both appropriate and inappropriate places.

The conflict of the academic administrator and institutional researcher may seem insurmountable from the foregoing remarks. But these remarks deliberately focus on the more negative behaviors and temporarily overlook the functional outcomes which flow from blending the two roles or, at least, require a continuous interchange between them. Rarely is the administrator evil and the researcher naive, but both roles contain elements for aberrant behaviors and a serious error would be made by disregarding their potential harmful effects on higher education goals.

The source of the disorder lies largely in the fact that neither academic administration nor institutional research are bound by any fixed set of methodologies. Unlike ordinary academic disciplines neither has a subject, only a role, and each uses whatever methods or techniques are available to enhance its performance.

The goals of higher education would be better served if administrator and researcher learned to accommodate each other's limitations. While the institutional researcher may be frustrated when he sees results from a carefully planned methodology being purified for external consumption, the administrator may be disheartened when objectives are dislocated due to prolonged attempts to improve the methodology.

There are no solutions to the conflict and probably none are required, but there are means for some accommodation. A premium means for accommodation lies in the development of a mechanism for administrator and researcher to establish, at least tentatively, common objectives both are willing to work toward, and to include in this understanding, minimum standards for the criteria by which both methods and results will be judged. While this recommendation may seem simplistic, in practice such understandings are rarely achieved. Another form of accommodation which would be beneficial is in more explicit delineations of the problems to be solved and of the anticipated results. While administrators rarely pose hypotheses for either rejection or acceptance, they ordinarily have expectations which are built into the development of programs being considered. When the institutional researcher clearly understands what those expectations are, he can choose the methodologies which give greatest promise for evaluating their probable utility.

The clinician tells us that schizophrenia is rarely resolved, only diminished. The quality of our administrative and research functions will depend largely on our own efforts to seek a remedy and to accept a lengthy program of therapy.

Ethical and Value Considerations in Institutional Research—James W. Firnberg

Institutional research is the slave of many masters. As institutional research practitioners we are accountable to ourselves, to our publics, our clients, and the field of institutional research. Our publics include society, the higher education community, and the state for the public institution or the corporation or board for the private one. Our clients are the state, board of control, president, other administrators, faculty, and students. We are also responsible to other institutional researchers.

We often find ourselves in a position in which we must choose between two or more of the interests represented by our publics and clients. Some would say we are called upon to apply situational ethics: "Most situations in which ethical considerations are inherent involve a hierarchy of values and this hierarchy must be redefined for each situation" (American Psychological Association, 1953, pp. 4-5). We each assess a situation as it arises, evaluate it in terms of our own value system and decide whose interests would be best served by our efforts. We do not necessarily think logically, rationally, or without bias in reacting to all situations. In these types of situations we might find ourselves in positions which might be considered similar to the relationship between any professional and his client. Multiple loyalties and responsibilities are inherent in the work of doctors and lawyers as in ours. Difficulty arises, however, when there is a conflict of interests. When interests conflict we must go back to the original situation and redefine based upon our individual system of values or weights. We must define for ourselves how to approach each situation.

The problem of whether we can be concerned only with the pursuit of truth, or whether we must also be concerned with the effects of our actions and our decisions must also be considered. Certainly, the potential consequences must be carefully weighed before a decision is reached. Our wisdom in reaching this decision will certainly be affected by the consequences of that decision.

In the pursuit of knowledge and truth, institutional researchers should be guided by the situation as well as the principles of democracy. We certainly should have the freedom of speech and the freedom of research. Perhaps this should be viewed as first the freedom of research and then the freedom of speech. Our loyalty is first to our own conscience and, since our major responsibility is to our institution, our loyalty is to our institution within the boundaries of our own conscience.

The question "What should we report to whom?" asks whether or not we should react to pressures to support our institution at all costs or to report our findings to those who sought the information and let it go from there. I conclude that we should treat with extreme care any information which has an obvious potential for adversely affecting the institution.

In the area of confidentiality we must place the highest value on objectivity, integrity, proper procedure, accurate reporting, and the use of good judgment. Again, we could, and sometimes do, find ourselves in conflict with our values and ethics.

We are obligated to our institutions and our profession to report the facts and the methodology, to suggest possible alternatives on the basis of our view of the circumstances surrounding each situation, and to suggest likely consequences of the possible alternatives.

We have an obligation not to distort the data nor to conduct "research" with results spelled out in advance. We have an obligation to prepare accurate reports which will be of value to those in our institution who have requested the data, as well as others who might use the reports. This, depending upon the type of data, must be done in such a way to protect the interests of our institution.

As institutional researchers we do have a responsibility to provide certain standards of performance for the profession. The respect which the field of institutional research has gained over the past two decades is based upon the quality of individuals we have attracted, our research, writing, and service.

The Association for Institutional Research has, as an organization, and many of its members have individually contributed toward the establishment and maintenance of high standards of competence and performance. This has been done through presentations at the Annual Forums, through the sponsorship of workshops, and more recently through our publications. We must each make a personal commitment to live up to professional expectations.

The Relation of Roles to Ethics and Values of Institutional Research—Warren W. Gulko

Because of the organizational dynamics of institutions, the North American directors of higher education institutional research are required to occupy a variety of roles. The primary role played by the directors of institutional research varies from individual to individual and from institution to institution. However, I suggest these roles fall into three general categories:

- The Institutional Research Scholar Role
- The Institutional Research Data Provider Role
- The Madison Avenue Role

The Institutional Research Scholar Role Model. One prominent role model is that of the Institutional Research Scholar. Individuals occupying the role of Institutional Research Scholar are typically oriented external to their institution—focusing their energies and output on contributions to the field of institutional research. The Institutional Research Scholar's activities are usually conducted under the aegis of a joint discipline identification, in that the individual brings to the field of institutional research an identity with a specific academic discipline. There are, of course, a few notable exceptions—Institutional Research Scholars who identify primarily with the field of institutional research and have made significant contributions to our profession. More typically, however, the major contributions to the field of institutional research are focused in specific academic areas such as educational psychology, management science, sociology, and others. Most institutional researchers who are engaged in the Scholar role judge their performance by the quality and quantity of their publications. Because they operate in a quasi-academic mode, the values and ethics that they bring to their work are typically those associated with their academic discipline. They tend to function in accordance with the standards of academic freedom and in the context of the scientific method.

Institutional Research Scholars typically work at institutions, but work for the profession of institutional research. They are accountable to their colleagues in the field for the quality and quantity of their work. Within the context of their discipline, their identity is with the profession of institutional research. They are loyal to their sense of professional and academic integrity. Although their work is discipline oriented, it is hopefully value free. In most cases, their contributions to the field continue regardless of their positional role or institution. Thus the Scholar may change titles and in some cases even change employment, but the general thrust and nature of the work goes on.

The Institutional Research Data Provider Role Model. As I have travelled around the country and visited many schools, I have observed a second, alternative model for institutional research—that of the Institutional Research Data Provider. The Data Provider is working for the institution, is accountable to the institution, and judges his or her performance on the quality, and sometimes, unfortunately, the quantity of output. The Data Provider is characterized typically as a decision facilitator. The motivation for providing data is to facilitate and enhance decision-making. Recognize, however, that there is frequently a problem in distinguishing between what is information and what is simply data.

The Institutional Research Data Provider typically provides unbiased analyses which are reasonably objective within the confines of his or her discipline orientation. Again, the discipline background of an institutional researcher plays an important part in shaping his or her behavior and the nature of his or her work. Each person can view the world only in the context of their own set of experiences. As so aptly described by Porter (1962), it is our discipline orientation that shapes our perception of a given situation, and it is within the structural context of our discipline that we respond.

Institutional Research Data Providers typically extend their loyalty to the institution; however, such loyalty is occasionally manifested in a dedication to the institution's data rather than the institution itself. This confusion arises because of the failure to distinguish between data and information. We all know of cases where individuals occupying the role of Data Provider have not bothered to concern themselves with the actual decisions that are being made. Therefore, the information which would facilitate specific institutional decisions is never provided. Rather, the focus is on the data. It spews forth periodically in a variety of bound reports on the assumption that someday, someone, somewhere, will need to make a decision and, therefore, the data provided in the report will in some manner facilitate the resolution of a particular problem.

The Data Provider usually provides broad campus distribution of the results. However, I know of particular schools, and I am sure that you do also, where the institutional research office operates in a pseudo data provider mode by providing reams of data, but only to themselves. Reports are published but few copies are distributed and serve only to fill the shelves in the office. Such an approach to institutional research is certainly beneficial in that these rows and rows of reports provide excellent soundproofing for an office.

Ideally, the individual occupying the Institutional Research Data Provider role is a decision facilitator, a professional who anticipates institutional decisions and is capable of providing the appropriate information in a timely manner. If the data is arrayed in a format that facilitates decision-making and is available to the decision-maker in time to enhance the decision-making process, the Data Provider becomes an Information Provider.

The Madison Avenue Role Model. The third role that I would like to explore is one which I regard as the Madison Avenue role model. In the Madison Avenue model, the institutional researcher adopts the role of a huckster. The institutional research office is concerned with justifying decisions after they are made or conducting studies and research with predetermined outcomes. The Madison Avenue person judges his or her performance on the ability to play a shell game with data. We usually find such individuals operating in a staff relation to a single person within the organization, typically the president or chancellor. Their function is to justify a policy decision, advocate a particular point of view, rationalize a single alternative. Their output is rather limited, tending to take the form of draft speeches, staff papers, memoranda, etc. Their contribution to the field of institutional research is limited. Indeed, if they are successful in their work, and they conduct it under the name of institutional research, they do great harm to the field.

Although many of you may find the Madison Avenue model objectionable, recognize that it is a reality. Moreover, recognize that it is a necessary role to be fulfilled in virtually any large complex organization. I think we must ask ourselves whether the standards and ethics of institutional research permit such activity to be conducted under the guise of institutional research.

In my judgment, the institutional researcher occupies at various times each of these three roles and appropriately so. Every professional institutional researcher must, on occasion, occupy the Scholar role in order to both benefit themselves through maintenance and revitalization of their skills and in order to foster innovation and advancement in the field. Secondly, I believe that all institutional researchers must occupy periodically the Data or Information Provider role. From my own discipline orientation, I find that this role dominates my own personal activities. But even for the person whose professional life is dominated by the Scholar role, it is necessary to occasionally occupy the Data Provider role simply because the scholarly activities are of little or no value to the institutional research profession unless they somehow contribute, either now or in the future, to the pragmatic applications of institutional research. For this reason it is necessary for the Scholar to maintain a meaningful relationship with the practical applications of the field.

Finally, it is appropriate for the institutional researcher to occupy occasionally the Madison Avenue role. You'll recall I suggested earlier that the Madison Avenue model is an appropriate model in virtually all large scale organizations.

Because of the skills and capabilities associated with institutional research, the institutional research person may be called upon to play the Madison Avenue role. Some degree of advocacy is present in everything we do. For example, the Institutional Research Scholar is frequently advocating a position or particular perspective. The standards of academic scholarship, however, require that such advocacy go forth with authenticated and replicable data, what we might want to think of as an "objective prejudice". Indeed, under the Data Provider model there may be room for a little bit of Madison Avenue activity, in that it may be necessary to get someone's attention (as in the old story of the farmer and the mule) in order to facilitate the decision-making process.

However, when called upon to play the Madison Avenue role, the professional in institutional research must recognize that there is no place within his or her field for deceit, distortions, and arbitrary analysis. Nor is it appropriate within the standards and ethics of institutional research practice to engage in "hucksterism." For this reason, it is important for us to recognize that the Madison Avenue role may be a necessary function, and if called upon to perform this function, we should do so only in the context of a staff relationship to a particular individual, and in an anonymous manner. We must ensure that the performance of prejudged or extremely biased analysis does not take place under the aegis of institutional research if we are to foster the legitimacy of our profession, and if we are to establish and maintain appropriate professional standards and ethics.

Ethics and Values in Institutional Research—Paul L. Dressel and Thomas M. Freeman

We would like to offer brief answers to the ten questions posed above, and to elaborate on our response to question ten.

1. For whom do we work, or to whom should we be accountable? Ultimately, we are responsible to all our constituents since they are involved in, or reported on, in much of what institutional research does.
2. What sorts of restraints are or should be accepted in our pursuit of the "truth"? It is necessary to recognize reality in answering this question. We are subject to pressures and specific points of view which we need to recognize and deal with. The art of presenting unpleasant data is to be commended since the objective of much of institutional research is to be factual, honest and diligent in presenting materials, but never foolish or boorish, since change is hopefully one of our goals and not data development and reporting only.
3. To what or whom do we owe our loyalty? Our loyalties should be such that we can retain integrity in dealing with our work as individuals, as an office and as a profession, always remembering that loyalty to the institution need not mean disloyalty to the tenets of institutional research or our conscience. Above all, there must be integrity, otherwise, credibility and other values necessary for sustained effectiveness are greatly diminished.
4. Can or should a distinction be made between institutional research and decision-making based thereon? There can be a distinction and there has to be in a great many cases. But in drawing a distinction between being a decision-maker in policy or operational matters and the role of institutional research in supporting that function, it is necessary to hope that the institutional researcher is cognizant of the decisions that need to be made. Playing with numbers and designing elaborate and interesting studies that are irrelevant to current or future needs of the institution or of higher education is not a kind of separation to be endorsed. To avoid being a servant to a preconceived decision is our job, but we are also required to be relevant to decisions that need to be made.
5. To whom should we reveal our findings? It is necessary to have candor in deciding who will receive the findings as well as candor in reporting the findings. Another way to think about this is to remember that one way to defeat a good study is to fail to recognize the power inherent in effective distribution, presentation, and follow-up. In some cases, there has to be a limited distribution because of the nature of the material, but, as a principle, dissemination is preferable over restriction.
6. What should we report? There are those who feel that it should be facts only without implications or interpretations, but making institutional research relevant and useful sometimes requires providing more than facts in some cases and facts only in others. There is no single answer to this question.
7. What sorts of confidentiality should we observe? Some confidentiality is dictated by law, by convention, or by discretion, but confidentiality should be limited and not widely used as a pretense to avoid review, criticism, and counter-arguments to that which is being presented.
8. Should we have an obligation to share our findings and methodologies with our colleagues in institutional research? A sharing of the findings as well as the methodology is to be encouraged, since the problems being dealt with are common to most institutions.
9. Should we attempt to influence the manner in which and the values brought to bear as our information is employed in decision-making? Generally, the answer is no, but the values brought to bear on the information ought to be known if they vary in significant degree from those previously stated or expected. Certain values are inherent in the process and are reflected in the study, as, for example, when one value (efficiency) may outweigh another value (quality) in the nature of the questions asked.
10. What are the values that are brought to bear as decisions based upon information are made? Which are appropriate and which are not? Part of the exchange between the decision-maker and the institutional researcher relative to data bearing on a decision will be an array of values emphasized and employed by the participants. It is the unwillingness to recognize values inherent in the very nature of the questions asked that often poses a problem. That unwillingness is as common to non-institutional researchers as it is to the institutional researchers.

The institutional researcher must be mindful that the policies and decisions formed from his data are always made in reference to some set of values. Thus he should identify a number of values and consciously keep them in mind as he organizes and presents data. The following exemplify some of the relevant values.

Many studies grow out of a concern about the *representativeness* of the institutional population on such factors as race, sex, geographical sources of students, and institutional sources of degrees held by faculty. This is one of the major concerns currently with respect to minority groups and women. In addition, one might see it as a value applied to the data in judging the data with regard to a problem. Is the data representative of the problem being analyzed? The concern for representativeness pervades all empirical research.

A second value is that of *equitability*, or fairness, which is in some sense involved in representativeness but becomes more explicit when attention is turned to the salaries of men and women, the grading patterns of various instructors, the size of departmental budgets relative to the load carried, and the faculty loads within and among departments. As with many values, it is easier to make a commitment to the value than it is to be sure that the value has been adequately met. The range of considerations (including period of service, quality of research and teaching, and market competition) involved in the determination of salaries makes it very difficult to determine equitability. And the distinctive elements in the work of such departments as music and mathematics make it difficult to ascertain the equitability of the staff load across departments.

A third value is *feasibility*. Such a pragmatic concern may not be readily accepted as a value. Yet, in starting a new program, it is necessary to know whether resources will be available. Research of any kind involves the development of new conceptions, distinctions, and definitions. But the feasibility of a definition or the attempt to use a distinction may eliminate it from consideration. Thus, in collecting data on the use of faculty time, someone might suggest that distinctions be made on time spent on scholarship, or creativity, and on research; and someone who attempted to use these categories might conclude that this is not a feasible distinction.

Another value may be described as *suitability, appropriateness,* or *relevance*. It becomes apparent in examining the relationship of grades to the abilities of students or the relation of admission standards to program requirements and success in programs. The educational program of a college must have an appropriate relationship to the kind of students with whom it deals; and when it becomes apparent either that unusual numbers of students fail or that the standards of particular fields are too high for the students, some adjustments must be made. Admission standards must be relevant to scholarship standards. Finally, suitability, appropriateness, or relevance must be considered as a value to judge any date or decision.

Another highly pragmatic value is *necessity*, which involves a judgment of the importance and the reality of the social needs to be met by an institution. Studies oriented to this value attempt to document the deficiencies which need to be corrected or ameliorated by development of an educational program. Necessity plays a major role in almost all proposals in higher education. Faculty members presenting a new program are sure that it is necessary; students are convinced of the necessity of anything that they demand; and the public—despite its complaints about the expenditures of higher education—also makes demands upon it. Necessity is not an absolute; it merges into the determination of priorities. It is a major problem we face in evaluating various alternatives either as an institution or as a society. One person's necessity is another person's luxury.

The determination of priorities is a major and continuing task in higher education as it is in most enterprises. Resources are never adequate for the many "necessary" demands which are presented. Improvement in salaries and fringe benefits may be given high priority, but, if resources are at the bare operational level, nothing much can happen. Pragmatically, the first priority is always the continuing operation of the institution, even though for some institutions outsiders may doubt that this is the wisest course. Likewise, one must balance survival of one part versus the survival of the whole institution. On most campuses the library holdings and staff are considered somewhat inadequate, but other program requirements frequently are given high priority. Buildings and equipment are a continuing problem which involve so many factors that priorities are seldom fixed.

Efficiency is a central concern in many of the efforts of the office of institutional research. It is a focus in studies involving degree or credit hour costs, section size, space utilization, operation of the library, registration, and the enforcement of policies and requirements. The ultimate concern of efficiency is maximizing the rate of return for the investment in higher education. It is an economic value pertinent to wise use of scarce resources and requires a continuing attention by institutional research.

Quality is a major value, especially in reference to publication, fund raising, and other uses of data emanating from the institution. Number of staff in *Who's Who*, number and place of publications and acceptances—all are examples of data collected in an attempt to determine the quality of an institution. Unfortunately, many of these turn out not to be statements of quality but to be statements which are presumed to document quality. Proxies for quality are various inputs, such as student ability levels, faculty publication records, and general resource support that, in combination, imply "quality." Direct measures of quality are often not possible, but so long as higher education continues to state quality as a major reason for more money or less faculty work load or the survival of high cost units, quality cannot be presumed to go unchallenged by critics. If we can define quality, we had better be prepared to answer how to get it for two cents a ton less.

Once it becomes clear that values provide the basis for the development and use of institutional research studies, it becomes evident that institutional research is more than data collection. However, its reports and conclusions cannot be based simply upon values or interpretations of values by those conducting the study. How does one decide whether an operation is efficient? How does one discern the quality of an institution? What are the criteria for judging the feasibility of a project?

There are at least five rather distinctive bases for judgment. The first of these is *comparison with other relevant data or with similar institutions*. Comparisons may be internal or external, depending on the nature of the concern. The staff of one department may feel that their salaries are not comparable with those in another or they may feel that there are inequities in load. Cases for improvement of salaries are almost always based upon comparisons with other groups of institutions—usually carefully chosen to suggest that the institutional salary level is inadequate. Tuition and fee charges also tend to be adjusted with an eye to the charges in other institutions. Some comparisons are more or less informative, and some involve relationship of data to established norms. Studies of grade distributions made within the institution or in comparison with like departments in other institutions may be regarded primarily as informative, although highly deviant distributions may result in pressures for modification toward an average. But, for library holdings, standards suggested by various authorities have become the basis for a normative judgment as to adequacy or inadequacy.

The second basis for judgment is *the existence or the development of theoretical or empirical models*. After a study of grades, recommendations have been made on some campuses that grade distributions approximate a certain pattern (A's, 5 to 10% ; B's, 20 to 25%). Curriculum requirements are often based on a model which implies that a student has a certain breadth and depth in his studies, as well as certain specific experiences in areas such as writing and a foreign language. Some institutions have developed formulas for determining the staffing of a department or the total institution on the basis of specified loads, average salaries, and the like. Generalized campus models suggest how classrooms, library, housing, and maintenance facilities may be arranged in order to facilitate movement, create a strong educational environment, and encourage a community spirit. Through the use of the computer, it has become possible to develop fairly elaborate models of the operation of an institution. These models can become the basis either for planning or for appraising operations to determine in what respects either they are inefficient, or, the model is inappropriate.

A third basis for judgment is *the application of absolute standards.* Tenure regulations tend to be highly specific and are adhered to vigorously. Student records provide another example of the need for absolute accuracy; even occasional errors are a matter of great concern. Statements of due process prescribe standards and steps to be utilized in particular circumstances, with any variation becoming the basis for complaint.

A fourth basis for judgment is *cost-benefit or cost effectiveness analysis.* In this approach, the benefits of a number of different alternatives are examined in relationship to costs, and a decision is made on this basis. Implicit in this approach is the element of comparison, but the comparisons may become very elaborate as various aspects of benefits are taken into account. Though much discussed and strongly recommended, this approach has been little utilized because of the difficulties in assessing benefits or effectiveness, whereas costs can be more easily determined. Because cost determination is becoming more common and applied with increasing vigor, the survival of many programs will depend upon a clearer definition of benefits. Benefits of higher education programs have, for too long, been assumed and largely undocumented.

The fifth basis, *consensus,* is concerned with participation in judgment. Consensus moves beyond the judgments of individuals to the collective judgment of those concerned with a decision. In practice, consensus may result from presentation of a report, along with other information, to a group which ultimately, through discussing, politicking, or exerting pressure, attains unanimity as to action to be taken or an acceptable compromise. When students and faculty become involved in policy determination, problems are likely to be resolved on a consensus basis. By dissemination of pertinent data, an office of institutional research can contribute to making this a somewhat more rational process than it would otherwise be. Nevertheless, one has to realize that data utilization is, itself, a value that is often feared by those already using a consensus model or a political process model. Oftentimes, those who argue externally for funds based on logic of data, formulas, and analysis, find themselves at odds with those who wish to achieve results politically.

We conclude by suggesting that in the facts-to-information-to-decision equation the value variables may be at least as important as the facts ones. To our work we bring our *personal or professional values* of honesty, integrity, forthrightness, sensitivity, experience, judgment, knowledge, patience, and others. We consider, as well, the *institutional or societal values* of necessity, efficiency, quality, equitability, and survival. *Data development and analysis values* which should be considered include representativeness, consistency, feasibility, relevance, and realism. Values are involved at all stages of the institutional research to dissemination and decision process, from problem identification or topic selection to enlightenment or resolution. The manner in which values are reflected in our work influences significantly both the utility or impact of it and the degree to which it deserves to be labeled institutional research.

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INSTITUTIONAL RESEARCH DATA FOR "WHAT" DECISIONS?: RESULTS OF A SURVEY OF INSTITUTIONAL RESEARCH PRACTICES IN CANADA, UNITED STATES, WESTERN EUROPE AND AUSTRALIA.

Gilles G. Nadeau, Universite de Moncton and McGill University

In 1970, the Association for Institutional Research (AIR) conducted a study of its membership. Results indicated that the emphasis of duties and responsibilities among nine areas of activity of AIR members was in order of importance, "planning and coordination," "studies of students," "faculty studies," budget and finances," "organizational studies," "data systems and computers," with "space utilization," "curriculum studies" and "teaching" receiving lower ranks. If one assumes that such activities are being effectively used, then it could be said that most institutional research data, at that time, served the decision-making process regarding "planning and coordination," "students," "faculty" and "finances." In view of the apparent controversy in the literature (e.g., Dressel, 1971; Sheehan, 1972; UNESCO, 1968; AIR, 1970; Suslow, 1972) regarding the nature and purposes of institutional research, what is the general picture in 1975? What is the emphasis given in each area of decision-making in higher education in Canada, United States, Western Europe and Australia? How can this picture serve to clarify the role of institutional research in the decision-making processes affecting all components of the institution? For the young institutional research novice as well as the experienced practitioner it seemed imperative that updated empirical data be provided on these questions.

Purpose

The central purpose of the present study was to obtain empirical data indicating recent emphasis in institutional research activities and practices and to compare developments in Canada, Europe and Australia with the United States' experience. The hypothesis was that the general results would not be significantly different from those of the 1970 AIR survey of membership activities, but that further insight would be provided on specific areas of emphasis within the general categories of the AIR survey. It was hoped that from the data provided, an index could be prepared describing institutional research "units" and their activities.

Instrument

A short three-page questionnaire was constructed by the author in both a French and an English version. The instrument was prepared using AIR publications and two recent books by Dressel and associates (1971_a, 1971_b) of Michigan State University. The questionnaire requested data on the size of full-time student enrollment, the size of the faculty, the kind of institutional research "unit," and the number of institutional research personnel. A list of 34 areas of institutional research activities were grouped under 5 major categories: a) General, b) Administration, Management, c) Students, d) Faculty and Staff, and e) Curriculumn and Instruction. Each respondent was asked to indicate in which areas studies were recently *completed* and in which areas a study was *being planned*. Respondents were also asked to provide a list of completed studies and their most recent annual report if available. Copies of the questionnaire in both French and English versions can be obtained from the author.

Sample

During August 1974 the questionnaire was sent to the highest academic officer in 248 Canadian colleges, universities and associations (77 French speaking and 171 English speaking) listed in the Association of Universities and Colleges of Canada (AUCC) 1973 *Directory* (AUCC, 1973). It constituted the total population of Canadian higher education institutions. For the United States sample, the *1973-74 AIR Directory* was used and the questionnaire was sent to 375 AIR members who were listed as "director" of institutional "research," "planning," "studies," "analysis." Thirty two non-university groups, associations and foundations were added to the United States sample. These were obtained from Dressel's (1971a) *Handbook*. For the European and Australian samples the *World List of Universities* (International Association of Universities, 1973) was used and questionnaires were mailed to 55 West European institutions and 12 institutions in Australia and New Zealand. Most universities selected were members of the International Association of Universities (IAU). Due to financial constraints no follow-up was made. However a small request for replies was made in the October 1974 *AIR Newsletter* and a similar attempt was made through the AUCC *University Affairs*. A list of institutions and agencies contacted can be obtained from the author.

Analysis

All the responses were grouped by country of origin. For the European, Australian, and French Canadian samples replies were put in only one category due to the small number of returns. However, for the English Canadian institutions two groups were formed on the basis of size of the student body: 1) community colleges and institutions with less than 5,000 students, and 2) institutions with 5,000 or more students. For the United States institutions, replies were grouped under three categories: 1) community, junior colleges, and small universities (5,000); 2) institutions with enrollments between 5,000 and 10,000 students; and 3) institutions with 10,000 and more students.

Results

The basic descriptive data on the sample, size of responding institutions and size of the institutional research personnel is provided in Table 1 under the different subgroups. Table 2 presents the kind of institutional research units under each category of institutions and the frequency distribution for each general and specific institutional research activities. A

Table I

BASIC DESCRIPTIVE STATISTICS ON THE SAMPLES AND SUBGROUPS OF INSTITUTIONS

	CANADA					UNITED STATES					EUROPE	AUSTRALIA	
INFO:	(1) English Colleges & Universities <5,000	(2) Universities >5,000	(3) French Institutions	(4) Associations & Agencies	(5) Total	(6) Colleges & Universities <5,000	(7) Univ. 5,000-10,000	(8) Univ. >10,000	(9) Associations	(10) Total	(11)	(12)	(13) GRD. TOTAL
Number contacted	(162)[a] —	—	—	15	(177) 248 (56%)	375			32	407	55	12	722
Number received	87 52	17	18	13	100	174 86	40	48	9	183	32	9	324
% Returns	(53%)			87%	40%	46%			28%	45%	58%	75%	45%
Average Total full-time student enrollment.	2,083	12,930	6,251	—	—	3,007	7,386	22,587	—	—	6,258	—	—
Range	75-11,000	5,400-21,130	75-25,000	—	—	415-21,127	5,000-9,752	10,000-54,872	—	—	460-13,000	—	—
n Reporting	44	14	10	—	—	81	39	47	—	—	9	—	—
Average total full-time faculty	178	835	590	—	—	183	477	1,591	—	—	812	—	—
Range	7-829	320-1,653	12-2,500	— —	— —	26-986	202-1,100	505-7,639	—	— —	21-1,226	— —	— —
n Reporting	44	13	10	—	—	81	39	47	—	—	9	—	—
Average Number of persons formally involved in Institutional Research	.90	5,50	2.25	3.75	2.46	2.10	3.02	6.70	—	3.57	3.00	3.50	3.28
Range	0-5	0-13	0-5	1-8	0-13	0-9	1-10	1-21	—	0-21	0-7	3-4	0-21
n Reporting	29	12	6	8	55	78	40	44	—	162	6	2	225

a. Numbers in Parentheses refer to Main Campuses (satellites removed).

Table 2

KINDS OF INSTITUTIONAL RESEARCH UNITS AND FREQUENCIES OF "COMPLETED" AND "PLANNED" STUDIES UNDER THE DIFFERENT SAMPLES AND SUBGROUPS

	CANADA					UNITED STATES					EUROPE	AUSTRALIA	
TYPE OF IR UNIT	(1) English Colleges & Universities <5,000	(2) Universities 5,000	(3) French Institutions	(4) Associations	(5) Total	(6) Colleges & Universities < 5,000	(7) Univ. >5,000-10,000	(8) Univ. >10,000	(9) Associations	(10) Total	(11)	(12)	(13) GRD. TOTAL
1. Office of IR	4	5	2	0	11	61	33	37	-	131	0	0	142
2. Division of IR	1	1	0	1	3	1	0	4	-	5	0	0	8
3. Centre of IR	0	0	0	0	0	1	1	0	-	2	1	1	4
4. IR Service	1	0	0	4	5	1	1	3	-	5	0	0	10
5. Person for IR	9	2	1	2	14	38	5	6	-	49	0	2	65
6. Committee for IR	3	1	0	0	4	6	1	2	-	9	0	1	14
7. Dept. of Higher Ed.	0	0	0	0	0	1	1	7	-	9	2	0	11
8. Unit Being Planned	1	1	0	0	2	1	0	0	-	1	0	0	3
9. Several Units doing IR	5	5	1	0	11	6	5	9	-	20	3	0	34
10. No Unit for IR	34	4	12	2	52	3	0	0	-	3	19	8	82
11. Other	3	7	2	0	12	9	4	5	-	18	3	1	34
TOTAL Reported	61	26	18	9	114	128	51	73	-	252	28	13	407

Table 2 (Cont'd)

IR ACTIVITIES	CANADA												UNITED STATES										EUROPE AUSTRALIA					
	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)		(11)		(12)		(13)	
	1a	2b	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
A. GENERAL TOTAL	79	42	48	15	8	1	12	8	147	66	300	139	131	70	168	84			599	293	22	7	6	6	774	372
1. Organization	16	4	9	1	2	1	2	2	29	8	34	12	9	9	19	5	-		62	26	5	2	1	1	97	37
2. Staffing	3	3	7	1	0	0	2	1	12	5	27	14	15	7	24	9	-		66	30	2	1	0	0	80	36
3. Goals & Objectives	18	9	7	3	0	0	1	0	26	12	42	23	23	9	25	13	-		90	45	4	1	0	0	12[illegible]	58
4. Long Range Planning	16	9	10	3	1	0	2	2	29	14	41	32	17	14	25	10	-		81	56	4	1	0	0	114	71
5. Self-Study	8	4	4	1	3	0	1	0	16	5	52	15	28	3	26	11	-		106	29	1	0	2	1	125	35
6. Evaluation	5	6	2	2	2	0	1	1	10	9	43	13	14	9	18	18	-		75	40	2	1	1	2	88	52
7. Innovations	4	3	3	2	0	0	1	1	8	6	27	13	8	9	9	4	-		44	26	2	0	1	1	55	30
8. Manpower	9	4	6	2	0	0	2	1	17	7	34	17	17	10	22	14	-		73	41	2	1	1	1	93	50
B. ADMINISTRATION TOTAL	55	25	47	12	1	7	16	10	119	54	202	114	110	67	149	74	-		461	255	22	8	2	2	604	319
1. Governance	6	2	4	0	0	1	3	2	13	5	17	11	5	5	13	3	-		35	19	3	1	0	0	51	25
2. Financing, Costs	12	2	10	5	0	2	3	2	25	11	48	21	28	15	32	21	-		108	57	5	3	1	1	139	72
3. Faculty, Staff benefits	8	1	4	1	0	0	1	0	13	2	26	8	18	6	20	6	-		64	20	0	0	0	0	77	22
4. Physical Facilities	15	6	11	2	0	2	2	1	28	11	53	21	30	11	31	14	-		114	46	4	1	1	0	147	58
5. Data Processing & MIS.	7	5	9	3	0	0	1	0	17	8	39	33	20	18	29	17	-		88	68	6	1	0	0	111	77
6. Regional Planning	3	8	3	1	0	1	3	3	9	13	14	14	7	9	15	9	-		36	32	2	0	0	1	47	46
7. Relations with Governments	4	1	6	0	1	1	3	2	14	4	5	6	2	3	9	4	-		16	13	2	2	0	0	32	19

a. "Completed Studies"
b. "Studies Planned"

Table 2 (Cont'd)

IR ACTIVITIES					CANADA										UNITED STATES						EUROPE		AUSTRALIA			
	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)		(11)		(12)		(13)	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
C. STUDENTS TOTAL	54	18	31	15	2	3	10	6	97	42	212	132	109	51	151	76	-		472	259	15	1	6	6	590	308
1. Admission & Prediction	18	7	11	4	1	2	3	1	33	14	59	26	29	8	34	17	-		122	51	6	1	2	1	163	67
2. Impact of Institution	6	3	3	1	0	0	0	0	9	4	25	22	14	7	16	6	-		55	35	1	0	0	1	65	40
3. Student Finances	5	2	1	1	1	1	2	1	9	5	14	12	7	2	17	5	-		38	19	2	0	1	0	50	24
4. Outcome & Alumni	7	2	2	3	0	0	0	0	9	5	41	29	15	15	16	15	-		72	59	0	0	0	1	81	65
5. Graduate & Professional degrees	1	2	2	2	0	0	3	1	6	5	14	9	14	2	20	9	-		48	20	0	0	1	1	55	26
6. Records	7	0	6	2	0	0	1	1	14	3	27	12	14	8	26	10	-		67	30	3	0	2	2	86	35
7. Student Personnel services	8	1	5	1	0	0	1	2	14	4	21	14	12	5	14	8	-		47	27	2	0	0	0	63	31
8. Extracurricular	2	1	1	1	0	0	0	0	3	2	11	8	4	4	8	6	-		23	18	1	0	0	0	27	20
D. FACULTY & STAFF TOTAL	36	19	29	20	6	8	10	6	81	53	179	90	87	45	127	62	-		393	197	19	6	5	3	498	259
1. Activities, Teaching load work load	11	5	10	7	0	2	2	1	23	15	57	23	29	13	38	16	-		124	52	5	2	2	1	154	70
2. Evaluation	9	9	4	4	2	0	0	0	15	13	43	20	14	13	17	13	-		74	46	1	1	1	2	91	62
3. Promotion, Tenure	7	1	7	3	1	2	2	1	17	7	25	15	17	6	24	14	-		66	35	2	0	1	0	86	42
4. Decision making	5	2	4	1	1	1	3	2	13	6	17	9	4	2	9	4	-		30	15	6	1	1	0	50	22
5. Research Activities	3	2	3	3	1	2	3	2	10	9	23	12	17	7	23	7	-		63	26	3	1	0	0	76	36
6. Service activities	1	0	1	2	1	1	0	0	3	3	14	11	6	4	16	8	-		36	23	2	1	0	0	41	27

Table 2 (Cont'd)

IR ACTIVITIES	CANADA												UNITED STATES								EUROPE		AUSTRALIA			
	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)		(11)		(12)		(13)	
	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2	1	2
E. CURRICULUM & INSTRUCTION TOTAL	34	21	13	12	1	5	3	3	51	41	134	78	66	40	88	45	-		288	163	18	4	5	6	362	214
1. Evaluation	14	6	6	4	1	1	1	1	22	12	37	25	12	12	18	11	-		67	48	5	1	2	3	96	64
2. Undergraduate programs	4	2	2	3	0	2	0	1	6	8	28	16	16	6	16	9	-		60	31	4	2	1	1	71	42
3. Graduate & Prof. programs	3	1	2	3	0	2	1	1	6	7	11	4	13	7	17	9	-		41	20	3	1	0	0	50	28
4. Accreditation	5	3	0	0	0	0	0	0	5	3	30	15	20	8	25	7	-		75	30	1	0	0	0	81	33
5. Innovations in Instruction	8	9	3	2	0	0	1	0	12	11	28	18	5	7	12	9	-		45	34	5	0	2	2	64	47

short discussion of these results follows under the four samples studied and the general total picture of all institutions combined.

A. United States

The United States sample was taken from the 1973-74 AIR membership directory with a total of 993 members. All "directors" of institutional "research," "studies," or "analysis" were selected for a total of 375 individuals. Also requests for information were sent to 32 associations, foundations, and agencies concerned with higher education. However, less than one-third of these replied, compared to 46% for the colleges and universities. The size of institutions varied widely within subgroups and for those reporting the information (162) the number of institutional research personnel ranged from 0 to 21 with a total average of 3.57 persons. The average number was 2.10 for colleges and small universities, 3.02 for medium size institutions and 6.70 for large institutions.

Table 2 indicates that 75% (131) of responding institutions had an "Office of Institutional Research," 28% (49) had 1 person responsible for Institutional Research mainly in colleges and small universities, and 11% (20) had several units conducting institutional research studies. Returns indicated that 1974 had one casualty, that is, one institutional research office was closed down in one institution. It is to be noted that very few respondents indicated institutional research activities in other units in their universities such as "Instructional Improvement Centers," "Centers for Teaching and Learning," etc. A review of such centers in Canada, United States, Europe, and Australia indicated several institutional research activities especially regarding students, faculty, innovations, instruction, programmes, curriculum and evaluation. The reader will note that the data in Table 2 is not mutually exclusive under the categories. The respondents were asked to indicate which ones were appropriate to their situation and, indeed, that some categories could be overlapping.

Institutional research activities under the *General* category are highest for self-study, goals and objectives and long range planning, evaluation and manpower in that order, while less emphasis was put on organization and staffing with innovations receiving lowest priority. Under *Administration and Management* highest concerns went to physical facilities, financing, costs, and data processing, while less emphasis was placed on faculty and staff benefits and little emphasis placed on governance, regional planning, and relations with governments. Under *Students* some 70% (122) of respondents indicated recent studies of admission and prediction followed by studies of alumni and student records. Less than a third of the respondents indicated studies of the impact of the institution with still less attention given to graduate and professional degrees, student personnel services, student finances and extra-curricular activities. Under *Faculty and Staff* greater emphasis was placed on work loads, teaching loads, and activities studies followed by evaluation, promotion and tenure, and research activities with little emphasis on service activities and the role of faculty and staff in decision-making. Finally under *Curriculum and Instruction* highest emphasis (43% of respondents) was placed on accreditation followed by evaluation and undergraduate programs with innovations in instruction receiving attention by less than 26% of the respondents. There seemed to be no important differences between the three sizes of institutions in the United States sample.

To get some further insights into the institutional research studies done mostly in the United States (some in Canada) the following frequency table was compiled from the 1971-72 and 1972-73 AIR *Annotated Bibliographies of Institutional Research* (Morishima, 1972, 1973).

Category	*Number of Studies* 1971-72	1972-73	*Total*
A - General	19	25	44
B - Administration	26	39	65
C - Curriculum and Teaching	35	28	63
D - Faculty and Staff	9	8	17
E - Students	74	73	147
F - Other	23	8	31
Total	186	181	367

B. Canada

The Canadian sample consisted of the entire list of institutions and associations of the AUCC 1973 *Directory*. There were 36 universities (main campuses), 15 associations, agencies, committees of presidents, etc., 126 colleges (main campuses) and 71 "satellite" campuses of universities and colleges. As indicated in Table 1, respondents were grouped in four categories: 1) English speaking colleges and small universities (less than 5,000); 2) large English speaking institutions (more than 5,000); 3) French speaking institutions; and 4) associations and agencies. There were 100 respondents out of the 177 (56%) main campuses and associations. The size of institutions varied greatly within the three categories concerned. The average number of institutional research personnel varied from less than 1 to 5.5 persons with an overall average of 2.46 persons. Total range varied from 0 to 13 persons.

Table 2 indicates that out of the 100 respondents, 11 reported having an office of institutional research and 52 had no institutional research "unit" of any kind. Fourteen indicated that 1 person was responsible for institutional research and 11 reported that several "units" were conducting institutional research. Returns indicated that one institutional research office closed its doors in one Canadian institution in 1974.

Regarding institutional research activities for the total Canadian sample, organization, long range planning, and goals and objectives received most emphasis among the eight general categories of activities. For the other categories, activities seemed to be highest for administration and management followed in decreasing order by studies of students, faculty and staff, and curriculum and instruction. Within these general emphases, frequency of activities were highest for physical facilities, financing and costs, student admission and prediction studies, work and teaching loads of faculty and staff, and evaluation of curriculum and instruction. The general patterns of emphasis seemed very similar to the data from the United States sample. There seemed to be no important differences in emphasis between the two Canadian English speaking subgroups on the basis of the size of the institutions.

To further understand the Canadian picture, an analysis was made of the most recent inventory of research in higher education in Canada published by the AUCC.

The 1973-74 *Inventory of Research Relevant to Higher Education in Canada* (AUCC, 1975) listed 169 studies in progress in Canada. This inventory did not include many confidential studies being conducted within Provincial Departments of Education and offices of institutional research for specific persons. The breakdown was as follows:

Category	Number of studies in progress
A - General	31
B - Administration	35
C - Curriculum and Teaching	42
D - Academic and non-academic staff	5
E - Students	44
F - Extension and Continuing Education	12
Total	169

Like the United States case, there seemed to be some discrepancies between published or available or "advertised" studies and the reported emphases in the sample of respondents. Regarding "studies planned," with few exceptions, the order of emphasis seemed to follow the emphasis in "completed studies" in both the American and Canadian samples.

C. Europe and Australia

As mentioned earlier, the *World List of Universities* was used to select a sample of major universities in Western Europe and Australia. The following indicates the sample.

Country	Total No. of Universities	Sample	
New Zealand	7	12	4
Australia	18		8
France	69	43	20
Switzerland	10		5
Belgium	10		5
United Kingdom	48		5
Associations, Agencies & Committees of Presidents in Europe			12

There were 32 respondents out of the 55 (58%) in the European sample and 9 out of 12 (75%) from the Australian sample. Nineteen out of the 32 European and 8 out of 9 Australian respondents did not have a "unit" concerned with institutional research. Since the number of replies in the institutional research activities are small, the reader is referred to Table 2 for the data reported.

To throw further light on these data an analysis was made of the two *Registers* published by the Society for Research in Higher Education (1972, 1973). *The Register of Research into Higher Education in Western Europe 1973* reported 172 research projects and studies in progress in higher education in Belgium, France, Austria, Denmark, Finland, Germany, Ireland, Netherlands, Norway, Spain, Sweden, Switzerland, and Turkey. Also the most recent *Register of Research into Higher Education - 1972*, mainly in the United Kingdom, listed 226 studies with some 20 studies from Australia. The following gives the breakdown by area of study:

Category	Frequencies in the Register of Western Europe (1973)	Frequencies in the Register of United Kingdom (1972)
A - General	12	23
B - Administration	26	32
C - Curriculum and Teaching	55	61
D - Faculty and Staff	3	13
E - Students	58	86
F - Adult Education	18	11
Total	172	226

Over half of the studies on higher education in progress dealt with students and curriculum and teaching, a picture similar to the corresponding Canadian and United States data.

Summary and Conclusions

In general, from the data of all samples in the present survey, with 324 respondents out of 722 contacted (45% returns) the order of emphasis among the 34 areas of institutional research and decision-making used in the study seemed to be as follows: "long range planning," "self study," "goals and objectives," under the *general category;* "physical facilities," "financing and costs," and "management information system" under the *administration category;* "admission and prediction," "student records," and "alumni" studies under the *student category;* "work load and teaching load," "evaluation," and "promotion and tenure" under the *faculty and staff category.* The *curriculum and instruction* category received by far the lowest emphasis—the most frequent receiving less than 30% frequency. Other areas receiving lower emphasis included "faculty service activities," "participation of faculty and staff in decision making," "student finances," "extracurricular activities," "regional planning," "relations with government," and "innovations." When compared to recent inventories of research on higher education in Canada, United States, and Europe some discrepancies were observed. In these inventories studies of "students" and "curriculum and teaching" received by far greater emphasis, with studies of "faculty and staff" being the lowest in frequency. In the present study the order of emphasis was "administration," "students," "faculty and staff," with "curriculum and instruction" being the lowest. For comparison purposes the data of the 1970 AIR survey of membership gave the following order of duties and responsibilities: "planning and coordination," "studies and students," "faculty studies," "budget and finances," "organization," "data systems and computers," "space utilization," "curriculum," and "teaching" receiving the lowest rank. Here again are some interesting reversals.

In conclusion several suggestions can be made for further analysis growing out of the present study.

1. A clarification of some of the discrepancies found in the present study in relation to the *published* or available literature on higher education should be made.
2. A detailed case study should be conducted of the two institutional research offices that closed their doors in 1974 as reported in this study.
3. Less than 10 respondents out of the 324 referred to institutional research conducted in their institutions under such "units" as "Instructional Development Agencies," "Higher Education Department," and "Centers for Research on Learning and Teaching." What are the relationships between "Institutional Research Units" and the above?
4. Many respondents reported being involved in conducting *mandated projects* in an overwhelming majority of their time, with some time for university-wide consultations and very little time for initiating their own studies. How generalized is this practice?
5. Some 20 institutions indicated a number of studies are being conducted annually in their institution. What studies are generally being conducted each year in institutions generally and which ones should be?
6. Taking each of the 34 areas of institutional

research in Table 2 and taking the frequency for each area as a sample of institutions, conduct in-depth studies of activities and procedures of these institutions under the separate categories.

7. The Association for Institutional Research or some higher education agency should prepare an index indicating places, institutions or agencies active in the 34 areas used in the present study to help identify places for internships and visiting scholars in specific areas of study. The relatively small number of institutions who replied (45%) in the present study, and the still smaller number who returned an annual report or a list of activities, does not justify the creation of such an index on the basis of that data. Nevertheless a list of institutions who replied to the survey has been compiled, and most sources of information on Institutional Research have been identified during the course of this study. A list of such sources can be obtained from the author.

Finally, the present study has identified major areas of emphasis in institutional research activities and these data should serve as working hypotheses in trying to identify what institutional research data are available and used for decision-making in higher education.

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INSTITUTIONAL RESEARCH: DOES IT MAKE A DIFFERENCE?

*Joseph Martin, Institute for Services
to Education*

Compared to a number of other areas of higher education, institutional research is in the embryonic stage of development. This is true in spite of the existence of professional organizations such as the Association for Institutional Research (AIR) and the American Educational Research Association (AERA).

Like all new professional fields in higher education, many of the activities of institutional researchers are focused on delineating a sphere of operation. How does institutional research differ from other research such as that done by sociologists and psychologists? Is it necessary to have a centralized institutional research function? What ought to be the role and function of institutional research in higher education.

These are fundamental and legitimate concerns for institutional researchers. They are unavoidable and must constantly be addressed in theory and practice. However, as important as the above institutional research concerns may be, the immediate survival of institutional research as a professional field does not rest exclusively on their resolution, but with the answer to the question: Does institutional research make a difference in the overall effectiveness of an institution's operations?

Developing institutions are facing very critical issues related to accountability, financing, and long-range planning. Because these are functions that are often expected to be carried out by offices of institutional research, the answer to the question, "Does institutional research make a difference in developing institutions?" has direct implications for institutional survival and, ultimately, the survival of institutional research as a profession.

Purpose

For the past three years the Institute for Services to Education has been involved with certain developing institutions which have received Basic Institutional Development Grants, under Title III, for the purpose of establishing new institutional research offices or strengthening existing offices. Three consortia totaling 34 institutions of higher education have received technical assistance from the Institute for Services to Education. To date there has been no large scale in-depth evaluation of the institutional research program. Hodgkinson (1974), in an assessment of Title III programs, indicated little beyond the vitality of these offices to survive after federal support was withdrawn.

The purposes of this study were: (a) to identify barriers which impaired the efficient operation of institutional research offices and to suggest strategies for overcoming these barriers, and (b) to evaluate the institutional research office's effect on the decision-making process.

Statement of the Problem

The research reported in this paper was undertaken to answer the question: Does institutional researh make a difference in developing institutions? Difference is defined as the effect of the institutional research office on the decision-making process. Effective institutional research reports must be comprehensive, objective, and timely in order that administrators may take full advantage of their content. For decision-making purposes, empirical criteria for effectiveness should be the utilization of information within specific program areas as well as the generalized perception of the office's effectiveness.

Literature Review

Institutional research, as a centralized activity in American higher education, is a post-World War II phenomenon which was necessarily expedited by the sudden rise in the student population and the sudden availability of foundation money for institutional self-studies. The interests and concerns of those involved in institutional research range widely. Pertinent research literature (Lins, 1963) runs the gamut from institutional cost analyses, to social-psychological theory about selecting and guiding students, to the economic pressures on professors. The complex environment in which the university operates includes internal situations within the university and external forces acting upon the university. All the constituencies in the college's or university's environment clamor for information about the institution. The function and impact of institutional research on the academic community can be viewed, nonetheless, through several general perspectives: (a) academic and administrative affairs, (b) policy formulation, and (c) university operations.

In an attempt to establish defined roles, Suslow (1972) noted that institutional research is considered to be a special kind of educational research in colleges and universities focused on the institution, and its products are largely directed toward academic planning and administrative activities.

Saupe and Montgomery (1973), in a statement prepared for the Association for Institutional Research, cited several definitions. One definition posited that:

> Institutional research involves the collection of data or the making of studies useful or necessary in (a) understanding and interpreting the institution; (b) making intelligent decisions about current operations or plans for the future; (c) improving the efficiency and effectiveness of the institution.

Perry (1972) stated that institutional research ought to concentrate on institutions which are outstanding, successful, unique, and self-actualized. Institutional research should study those students who are not problems but who are positive contributors to the university or college, its programs, and society.

Of primary importance to the work of institutional research, he contended, must be its ability to identify, describe, and articulate the creative quality of educational programs.

Braumbaugh (1960) projected wide-ranging operational roles, asserting that:

> Institutional research includes studies and investigations focused on current problems and issues in institutions of higher education. Also studies and investigations of problems and issues that are basic to long-range planning or that may ultimately have implications for institutional operations.

Parden (1971) expanded the role of institutional research to include planning, evaluation, and allocation functions. He argues for coordination of these functions instead of a segmented approach. Wedekind (1964) placed institutional research in the realm of institutional policy implementation. He contended that institutional research: a) is a staff function, not a decision-making function, and provides data on which to base decisions; b) should play a role in the evaluation of line operations in carrying out policy; and c) should serve the faculty as well as the administration in policy formulation.

Policy formulation in institutional research, as viewed by Brumbaugh, should include studies and investigations of problems and issues that are basic to long-range planning or that may ultimately have implications for institutional operations. According to Horn (1963) the ultimate goal of institutional research is to base policy decisions on reliable information about the institution itself. Decisions can be made intelligently and goals more easily achieved if research results are available; the source of information for planning and decision-making, in essence, will be the office of institutional research.

Sample

A sample of administrators from 34 developing institutions was selected to participate in the study. Usable responses were obtained from 187 respondents at 29 institutions. Respondents were drawn from public and private institutions as well as two-year and four-year institutions.

Data Collection

The questionnaire was developed by the staff of the Institute for Services to Education and consortium members. Questionnaires were sent to institutional research directors for distribution and collection. A three-week deadline for questionnaire return was used. Questionnaires were distributed to administrators—presidents, line administrators, and other staff persons who used the services of the institutional research office.

The instruments gathered three kinds of information: demographic characteristics of administrators, the administrators' awareness of institutional research, and effectiveness of institutional research.

Regarding demographic characteristics, administrators were asked about the form of control (public or private) of the institution at which they worked, about the level of offerings (junior or four-year) of the institution, and about the nature of the administrative position they held. Administrative awareness was assessed by asking administrators the extent to which they understood the role of the institutional research office on their campus: Who does the office serve? To whom does it report? Should the office be linked closely with the president's office? What should be the level of involvement in the decision-making process?

Effectiveness was measured on three dimensions: utilization of services and output, efficiency of operation, and general effectiveness. Administrators were asked: (a) how frequently they requested reports or services, what kinds of reports or services they requested, and how reports were used; (b) to rate the objectivity, scope, and timeliness of reports generated; and (c) to rate the general perception of the impact of the institutional research office and its degree of effectiveness in specific program areas.

Hypotheses

The working hypotheses in the study were as follows:

1) There will be a relationship between administrative awareness and the demographic characteristics of administrators.
2) There will be a relationship between the effectiveness of the institutional research office and the demographic characteristic of administrators.
3) There will be a relationship between the effectiveness of the institutional research office and the administrative awareness of administrators.

Data Analysis

All hypotheses were tested with the chi-square test of independence. Chi-square tests obtaining the probability of $p<$ .05 were reported as significantly different from zero and rejected the test of independence. Chi-square values less than the probability of $p<.01$ are reported as $p<.01$. Since each hypothesis is composed of several parts, it will be the general verification of the hypothesis which will be the criterion used to accept or reject the test of independence.

Results

Hypothesis One was generally not supported. Only one significant relationship was found. An administrator's length of time at the institution was related to his view on how an institutional research office should be linked to the president's office. The obtained chi-square value was equal to $X^2=21.40$, df 9, $p<.01$ indicating that those who had been at the institution longer favor institutional research being closely linked to the president's office.

Hypothesis Two stated there would be a relationship between the effectiveness of the institutional research office and the demographic characteristics of administrators. The data generally supported the hypothesis. Use of reports generated was related to the administrator's position for the following report categories: long-range planning, presidential reports, federal reports, fund raising, proposal writing, and accreditation. The obtained chi-square values were: $X^2=18.50$, df 9, $p<.03$; $X^2=16.84$, df 9, $p<.05$; $X^2=32.68$, df 9, $p<.01$ $X^2=28.66$, df 9, $p<.01$; and $X^2=17.48$, df 9, $p<.05$ suggesting that administrators make different uses of reports generated by the institutional research office in carrying out their administrative responsibilities.

Efficiency was the second dimension of effectiveness. The administrator's position was related to timeliness. The obtained chi-square value was $X^2=33.19$, df 18, $p<.05$. Presidents and academic deans perceived the office as more efficient than other administrators.

The third measure of effectiveness was general effectiveness. General perception was related to administrative position. The obtained chi-square value was equal to 46.21, df 27, $p<.01$. Differences among administrators were noted between federal program directors and registrars. These data suggest that administrators who need data from external sources perceive greater impact than those administrators relying on internal data sources. Specific areas of impact were related to institutional control, previous position held, and time at the institution. The obtained chi-square values were as follows: $X^2=7.07$, df 2, $p< .05$; $X^2=7.01$, df 2, $p< .05$, $X^2=16.36$, df 6, $p< .01$ respectively. Public institutions felt more impact on long-range planning than private institutions. Administrators who previously held faculty positions felt more impact occurred in the area of recruitment than administrators who held administrative positions. Administrators who had been at their institutions for less than five years felt more impact on the curriculum than administrators who had been at their institutions more than five years.

The third hypothesis was overwhelmingly supported by the data. Requests for services were related to understanding the role of the office and linked to the president's office. Obtained chi-square values were as follows: $X^2=19.01$, df 3, $p< .01$ and $X^2=24.24$, df 9, $p< .01$ respectively. Proper use of the office was related to understanding the role of the office, constituency served and reporting structures. The obtained chi-square values were as follows: $X^2=12.02$, df 3, $p< .01$; $X^2=25.07$, df 12, $p< .01$; $X^2=26.14$, df 9; $p< .01$, respectively. The data suggested that administrators who understood the role of the institutional research office were more likely to request services than administrators who did not understand its role. Administrators who felt the institutional research office should be linked to the president's office were more likely to request services than administrators who felt the office should not be linked to the president's office. Further, the data suggest that the institutional research office was underutilized and heavily weighted to its newness on campus.

The following report categories were related to understanding the role of the institutional research office: questionnaire completion, long-range planning, presidential reports and federal reports. The obtained chi-square values were as follows: $X^2=12.14$, df 1, $-p< .01$; $X^2=14.74$, df 1, $p< .01$; $X^2=3.78$, df 1, $p< .05$; $X^2=7.18$, df 1, $p< .01$ respectively. In all instances, administrators who fully understood the role of the office made greater use of these reports. Use of reports was related to consituency served in the following categories: questionnaire completion, long-range planning, and accreditation. The obtained chi-square values were as follows: $X^2=11.63$, df 4, $p< .01$; $X^2=14.12$, df 4, $p< .01$; $X^2=11.35$, df 4, $p< .05$. The data indicated that administrators who felt that the office served both administrators *and* faculty were more likely to use reports than administrators who felt the office served administration *or* faculty only. Participation in decision-making was related for the following categories: questionnaire completion, long-range planning and proposal writing. The obtained chi-square values were as follows: $X^2=9.55$, df 3, $p< .05$; $X^2=10.72$, df 3, $p< .01$; $X^2=7.78$, df 3, $p< .01$ $X^2=7.78$, df 3, $p< .05$. Administrators who felt that institutional research directors should participate in major institutional decisions were more likely to use reports than administrators who felt institutional research directors should restrict their activities to basic data collection.

Efficienecy of the office was operationalized as objectivity, scope and timeliness of reports. Understanding the role of the office was related to objectivity, scope and timeliness. The obtained chi-square values were as follows: objectivity, $X^2= 33.17$, df 2, $p<.01$; scope, $X^2= 18.65$, df 2, $p<.01$; timeliness, $X^2= 8.18$, df 1, $p<.01$. The data suggested that understanding the role and function of the institutional research office was highly supportive of the impartial manner studies were performed, and reports shared with administrative offices in a useful time frame for decision-making. The institutional research office being linked to the president's office was related to objectivity and timeliness. The obtained chi-square values were: $X^2= 37.19$, df 6, $p<.01$, and $X^2= 18.32$, df 6, $p<.01$. Administrators who felt the office should be linked to the president's office were more likely to perceive reports produced by the institutional research office as impartial and shared with their offices in a useful time frame.

Generalized effectiveness was related to several measures of administrative awareness. Whether the office should be linked to the president's office was related to impact on decision-making and general campus impact. The obtained chi-square values were: $X^2= 31.05$, df 9, $p<.01$ and $X^2= 22.49$, df 9, $p<.01$; thus indicating administrators who agreed that the office should be linked to the president's office perceived greater impact on decision-making than administrators who disagreed with the office being linked to the president's office. Understanding the role of the office and participation in decisions were related to the administrator's ability to accurately report data if the institutional research office was phased out. The obtained chi-square values were: $X^2= 47.43$, df 3, $p<.01$ and $X^2= 22.02$, df 9, $p< .01$. These data suggest that administrators who understood the role of the office perceived greater impairment in there ability to report institutional data than administrators who did not understand the role of the office.

Specific areas of impact—financial studies, admissions and records, recruitment, curriculum and planning—were related to the office being linked to the president's office. The obtained values of the chi-square were: $X^2= 19.57$, df 9, $p<.05$; $X^2= 13.57$, df 6, $p<.05$; $X^2= 14.57$, df 9, $p<.05$. The general finding was that administrators who agreed that the office should be linked to the president's office were likely to perceive greater impact than administrators who disagreed that the office should be linked to the president's office. Understanding the role of the office was related to curriculum and planning. The obtained chi-square values were: $X^2= 9.10$, df 2, $p<.01$; and $X^2= 5.89$, df 2, $p<.05$. Esentially, the data indicated that administrators who understood the role of the office perceived greater impact than administrators who did not fully understand the role of the office.

Summary and Conclusion

Hypothesis One was not supported by the data. The administrator's awareness of the role and function of the institutional research office was not related to their demographic characteristics.

Hypothesis Two was supported by the data. Administrator's demographic characteristics were related to the effectiveness of the institutional research office. Administrators varied most on the utilization of the institutional research office. Presidents and academic deans were more likely to request services and use research reports than registrars or financial aid directors. Presidents and academic deans were more likely to perceive the office as being efficient and generally effective than registrars and financial aid directors. In part, this can be explained by most institutional research directors reporting directly to these officers. It may be concluded that administrators who had direct contact with the institutional research office used its services and perceived it as efficient and generally effective.

Hypothesis Three was overwhelmingly supported by the data. Two administrative awareness variables (understanding the role and function of the institutional research office and the institutional research office being linked to the president's office) emerged as the most related to effectiveness of the institutional research office. These finding suggested that as administrators became aware of the role and function of the institutional research office and felt it should be linked closely to the president's office, they requested more services; made greater use of research reports; perceived the office operation as efficient in producing impartial, comprehensive, timely reports; and viewed the institutional research office as having an immense impact on the decision process.

The general implication to be drawn from this study was that administrators of developing institutions perceived the institutional research office as effective, hence making a difference. There were stong feelings for involving the institutional research office in the decision-making process. There were several ways this could be interpreted, but the most prudent would be that the institutional research director needs to be in a position of knowing what was to be decided in order that complete information would be collected. Administrators preferred the office to do more than basic data gathering and trend analysis, hence a closer link with the president's office was supported.

A key strategy for strengthening the institutional research function was the selection of an advisory committee with broad representation. The committee would be involved in setting office priorities, in disseminating information to other staff members, and in helping design and execute major research studies. A primary goal of the office would be an office prospectus outlining its goals and objectives for the year. Regular publication of summary reports for distribution among staff is essential. Institutional research will then have taken steps toward becoming a viable administrative function.

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MODELS - TOOLS OR CONTROLLERS

Frank R. Borchert, Jr.
Case Western Reserve University

In the real world where we all from time to time are required to function, the rules for analysts and managers are different. Managers, faced with a constant barrage of seemingly changing data, are required to make decisions and act in a forth-right or forward-moving way. To cope with these environmental conditions, managers form intuitive concepts or gestalt of the environment and the relationships of principal variables present in the environment.

The analyst also forms concepts of environmental behavior, but these concepts tend to be focused less by the general system or process influences on the manager than by the problems encountered by the manager in reaching a decision. The analyst's response to the managerial problem is to develop an abstraction—a model—which focuses on the decision to be made and positions environmental variables according to their perceived relationship to the decision or problem.

The analyst's model or abstraction is more formal in character and by its formality or overt rationality can convince the manager of the model's value in the decision process. More often than not a model can be a beneficial and useful tool in the process of management decision, if that model or its limits are understood by both analyst and manager. If the analyst and the manager ignore the limits of the model or do not test model realities, and instead use it to support a decision process, then both the manager and analyst will ultimately be victimized or controlled by the model.

The purpose of this paper is to reflect upon the intellectual limitation of models, however sophisticated they might appear. In the discussion which follows three model types will be discussed briefly: (a) a statistical model, (b) a structured model, (c) a simulation model. In each instance it will be shown that model abstractions have critical or fundamental propositions which, if not understood by the manager, can control the manager and cause him to act in ways different from what his intuition suggests might be the best course of action. In each instance the models selected for discussion are ones which are being used currently as part of a decision process, or address aspects of such decision process. The particular model examples discussed are: a statistically determined student application prediction model, a tenure staffing model, and a program budgeting system simulation model.

Student Application Prediction Model (SAP)

This statistical model was designed to address a set of familiar concerns of the institutional manager. By midway in an academic year budgets are being prepared for the forthcoming year. The admission staff is actively recruiting desired applicants. An initial flow of applications is being received. The questions posed by business and admissions officer are "what will the new student population be?" and "should current recruiting techniques be altered?"

A statistical model based upon recent historical data was developed. The crucial structure of the model involved the calendarized flow of applications in prior years. Analysis showed that for a reasonable previous time period applications for admission had been received by the institution at approximately the same calendar date and in the same proportions to the final total.

A logarithmic fitting of cumulative application receipts against time was used as the basic model. By using this structure, early returns from the current year's application flow could be inserted into the model and a prediction of total applications for the year obtained. Reasonably accurate predictions of the total applications can be available by December of each academic year.

The development of the model had been precipitated in the first place by rather sharp changes in the application picture and a subsequent smaller entering freshmen class. The analysts who develop SAP were able to provide responses to the managerial question "What number of first year students might be expected?" and permit the triggering of selected recruitment efforts.

The model design permits adaptation over time through the introduction of more recent information, and has proved to be a helpful tool supporting the manager of the admissions and budgeting process.

It is clear, however, that continuous effort must be made to remember that SAP, as a model, has no insights about the attitudes of prospective students. It predicts that what happened last year will happen this year or next year. If there are significant changes in the flow of applications, predictive results can vary greatly.

All statistically-based models of this ilk are perfidious. The system which is being artifically projected is unknown. No matter how reliable statistical correlations are, the model will continue to give accurate predictions only so long as the system underneath does not radically change. It is conceivable that the system can change without warning. If the model is trusted by analyst and manager implicitly, actions based upon such a model inevitably prove to be wrong and can be potentially disastrous. The critical continuing assumption of this class of models is that the underlying system will not change, and, consequently, predicted changes are real and should be responded to by the manager.

Faculty Tenure-Staffing Model

Another class of model is the type of model in which the system being approximated is understood and fully defined by the variables of that model. The model described and discussed here is one formulation of the tenure and steady state staffing issue and a management decision problem currently receiving extensive attention (Tannenbaum, 1972).

The model is an expression of the proportion of faculty holding tenure at any one time in terms of the length of pre-tenure period, mobility, defined as the fraction of tenured faculty who leave each year other than by retirement, and the ratio of untenured faculty who are granted tenure. Values for the model can be developed with relative ease by holding variables constant, setting ranges for allowable tenure to non-tenure faculty ratio, etc.

The initial objective of the model was to determine what tenure ratios might pertain under certain conditions and also to determine what actions might be necessary if the tenure ratios were established by arbitrary policy determination through a political process.

As the model was worked with and quantified, it was discovered that a crucial variable was the formulation of mobility. While mobility had been formulated as turnover, it became apparent that turnover behavior of prior periods might not be the appropriate measure to use in producing model estimates of tenure ratios. Further consideration of the model formulation led analysts and managers to conclude what is, of course, well known, namely, that long run mobility of the faculty is the crucial decision variable in this and probably all steady state staffing models.

In point of fact the complex mobility function issue of the steady state staffing model in the Tanenbaum model and others is not well perceived. Manager and analyst alike tend to concentrate on the length of the pre-tenure period and some a priori tenure percentage. Admitedly, deducing the long run or continuing mobility of faculty or professional staff involves a complex modeling of labor market factors, and consequently may not be feasible. It is equally clear that self delusion masked by a formal mathematical model is still self delusion. If the tenure-steady state staffing model is employed without both careful definition of the mobility or turnover variable and the vulnerability of all models with regard to this variable, the manager and the analyst become victims of the model and controlled by it.

The Total System Simulation Model

Models of this type are usually developed to assist the manager to deal with or respond to a complex set of allocation decisions, budget assignments, or program investments within the context of external forces and the on-going performance of more than one program or activity.

Total system simulation models are attempts to structurally define major inputs of a total entity such as an educational institution, or school, a social delivery system, a major weapons system, etc. The major elements of such systems include definition of outside forces on the system, state, or condition variables which define the system's structure, choice and response variables that reflect decision areas and define reactions of the system to its environment. A good example of such a system simulation model can be found in the Program Oriented Planning System (POPS) discussed later at this Forum (Kutina, 1974).

Simulation models contain variable relationship statements that reflect the analyst's perception of the world limited by constraints of linearity imposed by the need to operate these models on computers. Because of size and complexity, the model cannot easily be played with, to test where its priorities are, or how it responds to different functional inputs of data.

A critical variable of a program model such as POPS is the faculty activity matrix and how this matrix is formulated. Other models such as the National Center for Higher Education Management Systems (NCHEMS) model are significantly determined by the faculty allocation to program matrix and, of course, presumptions about rates of change in time allocations as real or model changes are introduced.

System simulation models, are intended to show changes in product or service production outputs relative to resource changes or environmental changes. There continues to be real difficulty in defining or distinguishing outputs which are meaningful when service systems are being simulated. Such weaknesses can be overcome, however, through agreement between analyst and manager upon simulating variables that capture in part the complexity of service outputs.

Sensitivity analysis which examines the behavior of the models under varying conditions and reveals its central concepts is essential for the manager if he is to use and/or become dependent upon such models for decision purposes. Some of this analysis is done by the analyst just so he can understand his own creation. But far less analysis of this variety is done in an interactive mode with the manager. As a user of such models it is imperative that you integrate the model before adopting its perception of the world being simulated.

Conclusion

This paper has addressed the issue that model usefulness for the manager or other analyst is dependent upon his or her recognition that a model is an abstraction. Created by the analyst to explain real world behavior, the models may have a number of design handicaps or weaknesses which, if not recognized by the manager, will weaken the value of the model as a managerial tool and pose the real threat of controlling the manager decision behavior against his own best interest.

Model weaknesses most often encountered, which both analyst and manager must guard against, include models that implicitly or explicitly depend upon a current reality which is not understood or cannot be adequately defined. A second major hazard lies in the single variable model, wherein one variable in the model turns out to be the critical and controlling part of the model.

A third and critical factor lies in the recognition that the complexity of large simulation models reflects their creator's vision of the system and the relationship of its many parts. Such systems, more often than not, tend to have one or two crucial determining variables or functions and these variables and their behavior hold the key to the analyst's concept of system.

Unless this conceptual design is perceived and related to the manager's own concept of system or order, interpretation of results is at best difficult.

When these conditions of model weakness are ignored or overlooked, the manager's use of the model or its informational output is of reduced value. When these potential difficulties are recognized and compensated for, however, the model can be a powerful and effective tool in the decision process.

Tanenbaum, B.S. Facts and fallacies about tenure in a steady state university. An unpublished technical report, Case Western Reserve University, December, 1972.

Kutina, K.L. A program oriented planning system for academic health centers. School of Medicine, Case Western Reserve University, 1974.

PROGRAM EVALUATION: FROM QUESTION TO IMPACT

Arthur L. Gillis, University of California
Ray A. Muston, University of Iowa

Program evaluation has three purposes: (a) to determine whether or not a program is effective; (b) to determine why a program is effective or why it is not; and (c) to provide recommendations to decision-makers as to modification, expansion, or continuation of a program. This paper is concerned with the primary terms and activities comprising program evaluation as it is traced through the political processes which spawned a particular program evaluation effort—from question to impact.

Evaluation may be viewed as collecting, organizing, analyzing, and reporting and interpreting information about the inputs, process, and outcomes of educational programs to determine their effectiveness in meeting their objectives (any why or why not), and to provide recommendations to decision-makers as to modification, expansion, or continuation of the programs.

There can be no doubt that there are several fuzzy, ambiguous words which have become fashionable in the political jargon of program evaluation. Notwithstanding the lack of specificity regarding the meaning of program evaluation, almost all reasonable observers of American higher education agree that the time has arrived—indeed has been with us right along, though too few have been aware of it—for higher education to take a close, careful, and critical look at itself. It is true that there has always been a need for institutions to conduct ongoing programs of self-evaluation, and most long-standing institutions have been committed to the principles of self-evaluation and planning since their individual inceptions. They have utilized collegiate and departmental self-studies, accrediting studies, and special reviews to determine program performance, status, and prospective future for all of their academic programs. These review mechanisms have been intentionally varied because program characteristics vary, with no one mold of review adequate for the wide-range of academic content and purpose.

A primary purpose of the traditional academic program evaluation was to provide the university with an aid in its continual striving for excellence and efficiency in its educational role through a regular internal and external audit of its performance on every level from that of department and program, through school and college, and ultimately to that of the entire corporate structure of the university itself. On every conceivably level, the institution attempted to identify and reassess its goals, to examine all of its functions in terms of quality and need, to establish priorities for retention, expansion, and implementation of programs, to review the supporting financial structure with regard to both sources and amounts of funds available for instruction, research, and service objectives, and to establish a base for future planning and development. Program evaluation was considered, then, as a continuing and positive process geared to promoting improvement through incremental budgeting and development. The form of these reviews, however, was open-ended. Little structure or commonality in data base marked the submission of program evaluations under the terms of historical departmental and collegiate studies. Also, these reviews had little relation to resource allocation decisions; they were self-cleansing exercises.

An Institutional Example

Beginning in 1972 the traditional forms of program evaluation in Iowa were no longer acceptable to both the Board of Regents and other state bodies concerned about program activities, resource utilization, outcomes, and costs. With the advent of program budgeting, the National Center for Higher Education Management Systems, shrinking enrollments, and rising costs, many members of the public bodies supporting the University began to ask hard questions requiring non-traditional answers. The new age of program evaluation/accountability was ushered in—the request for structured, uniform, timely, ongoing, and reported program evaluation (emphasizing costs) was issued.

In 1972 the University was first requested to develop program evaluation plans. The University response was a compendium of accreditation reports and a census of degree programs. Two years later a mandate was issued requiring the submission of specific procedures and timetables outlining ongoing and comprehensive program evaluation and planning procedures. The University was also required to submit the findings of each department's review on a biennial basis indicating both the decisions rendered relative to program maintenance, improvement, retrenchment, and the undertaking of new programs, as well as the resource allocation decisions made or proposed in support of program priorities. In addition, the use of the Resource Requirements Prediction Model (RRPM) developed by the National Center for Higher Education Management Systems (NCHEMS) was anticipated.

Whereas earlier institutional responses to information seekers somewhat shielded the faculty from the realities of the new age of academic accountability, the expansiveness of the new response called for full University participation in the tasks of program evaluation. The levels of participation, as shown in Figure 1, began with departmental development of program outlines, plans and priorities, followed by collegiate review and central administrative review before submission to the board of control. The draft of the program evaluation and planning methodology developed by a University committee encompassed 14 points of activity divided into three tiers of activity:

I. Department Responsibilities (shown in Figure 2):
  A. A Position Audit/Department Profile—Data Base (Where do we stand?)
  B. Program/Departmental/Characteristics (What are

Figure 1

PROGRAM EVALUATION

Overview

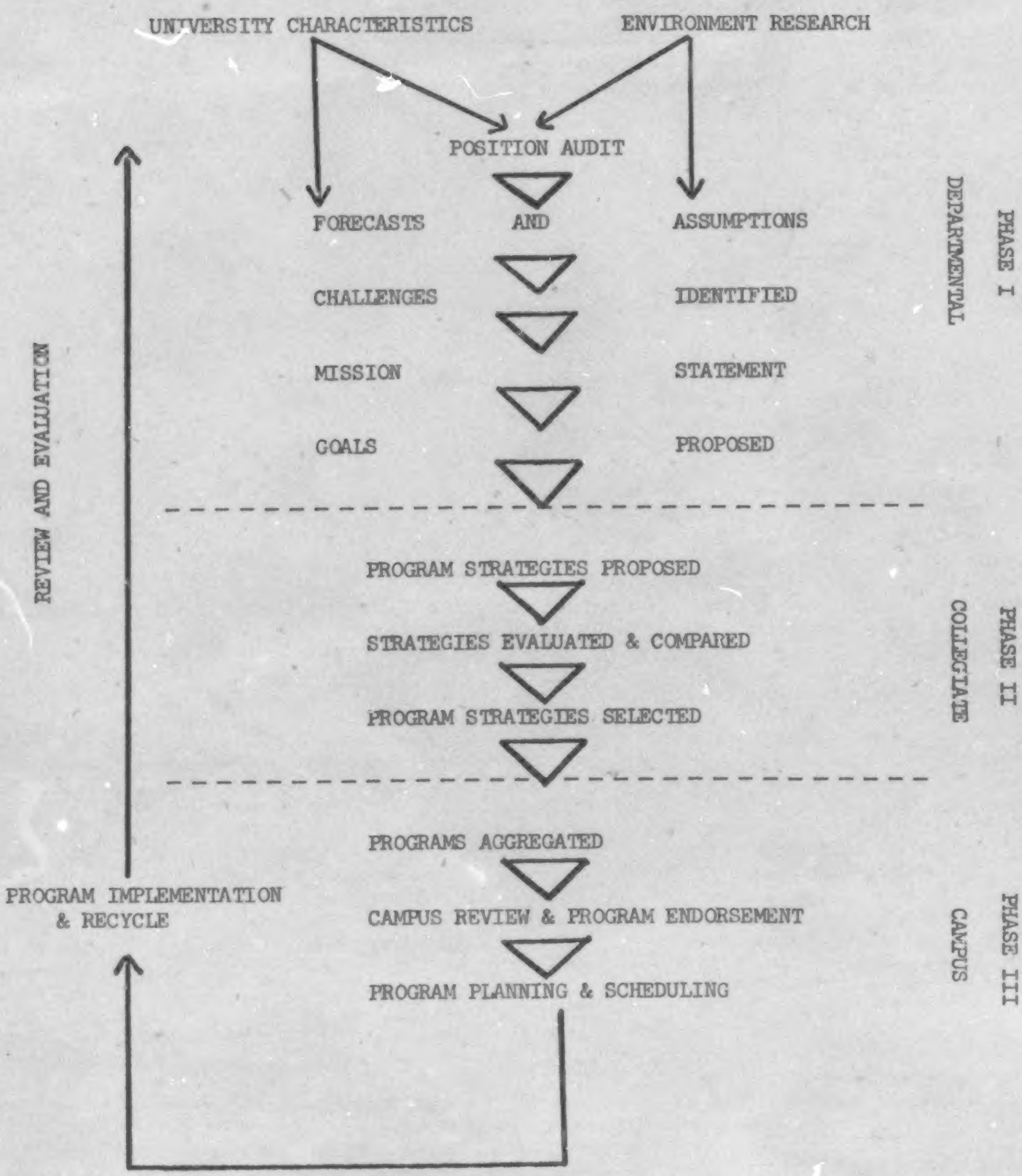
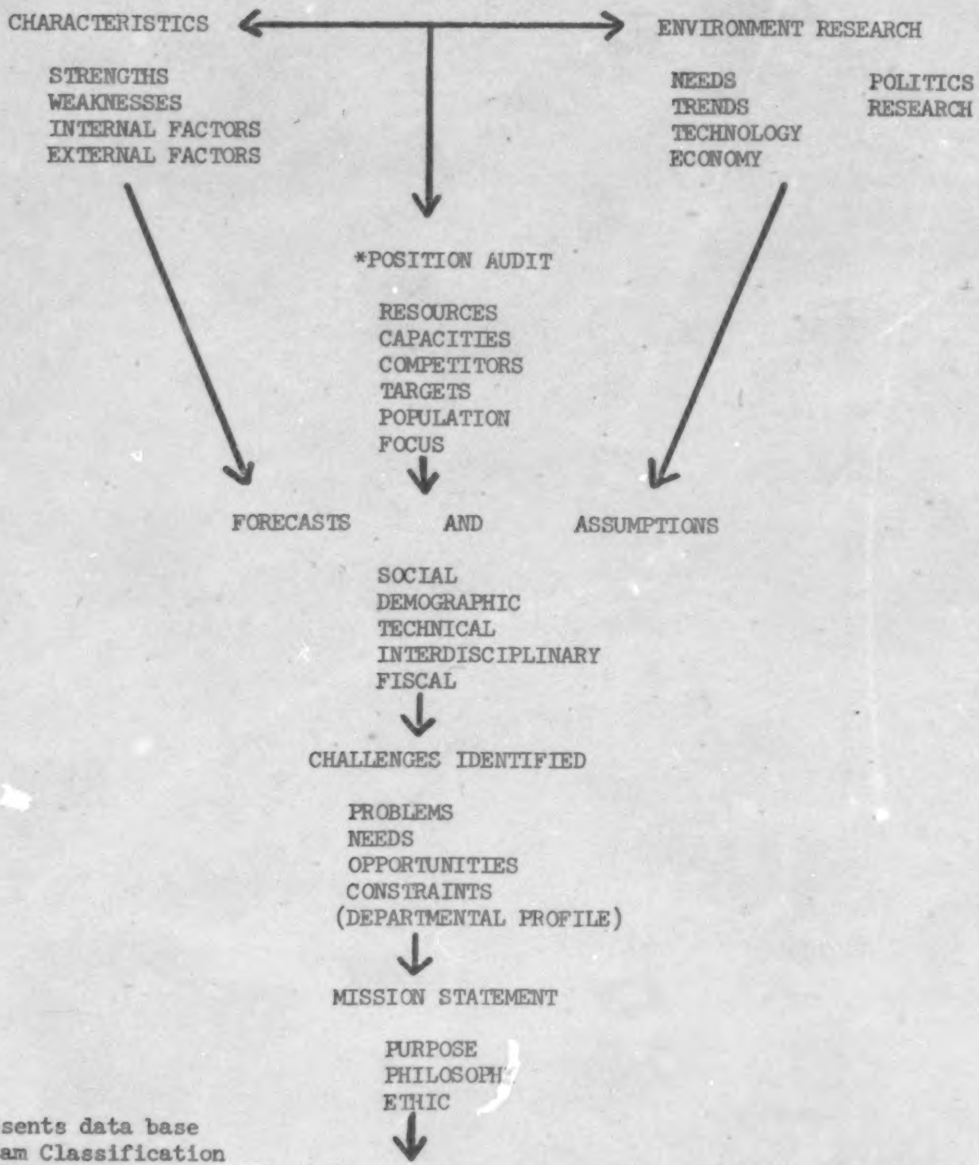

UNIVERSITY CHARACTERISTICS
ENVIRONMENT RESEARCH
POSITION AUDIT
FORECASTS
AND
ASSUMPTIONS
CHALLENGES
IDENTIFIED
MISSION
STATEMENT
GOALS
PROPOSED
DEPARTMENTAL
PHASE I
PROGRAM STRATEGIES PROPOSED
STRATEGIES EVALUATED & COMPARED
PROGRAM STRATEGIES SELECTED
COLLEGIATE
PHASE II
PROGRAMS AGGREGATED
CAMPUS REVIEW & PROGRAM ENDORSEMENT
PROGRAM PLANNING & SCHEDULING
CAMPUS
PHASE III
REVIEW AND EVALUATION
PROGRAM IMPLEMENTATION
& RECYCLE

Figure 2

PROGRAM EVALUATION

Phase I
Departmental Sequence


CHARACTERISTICS
STRENGTHS
WEAKNESSES
INTERNAL FACTORS
EXTERNAL FACTORS
ENVIRONMENT RESEARCH
NEEDS
TRENDS
TECHNOLOGY
ECONOMY
POLITICS
RESEARCH
*POSITION AUDIT
RESOURCES
CAPACITIES
COMPETITORS
TARGETS
POPULATION
FOCUS
FORECASTS
AND
ASSUMPTIONS
SOCIAL
DEMOGRAPHIC
TECHNICAL
INTERDISCIPLINARY
FISCAL
CHALLENGES IDENTIFIED
PROBLEMS
NEEDS
OPPORTUNITIES
CONSTRAINTS
(DEPARTMENTAL PROFILE)
MISSION STATEMENT
PURPOSE
PHILOSOPHY
ETHIC
GOALS PROPOSED

*NOTE. Represents data base using Program Classification System (PCS) and Higher Education General Information Survey (HEGIS) identifiers.

our strengths and weaknesses? What are our internal constraints and resources? What are the external constraints and resources?)

C. Environment Research (What is ahead for our discipline?)
D. Forecasts and Assumptions (What probably will happen?)
E. Identification of Challenges (How is the program/department affected: by forecasts, assumptions, constraints and resources? What are our priorities?)
F. Mission Statement (What is our purpose? What is our philosophy? What is our ethic?)
G. Goals Proposal (What to do? Why? What are the criteria for goal establishment and evaluation?)

II. Joint Departmental/Collegiate Responsibilities (shown in Figure 3):

A. Alternative Strategy Proposals (What approaches are suitable?)
B. Strategies Evaluated and Compared (How can the task best be done? What other criteria are to be considered?)
C. Selection of Appropriate Strategies
D. Program Proposals in Packaged Plan (What to do? Who should do it? When? At what cost?)

III. Central Administration Responsibilities (Shown in Figure 4):

A. Campus Review and Program Endorsement (What are the cost and cost-effective indicators? What are the output forecasts? How would you judge the quality of instruction, research, creative activity, scholarly efforts? How central is the activity? What is the value of the program to society? What are the program's potential and future expectations? How do these programs meet our mission goals?)
B. Program Planning and Scheduling (Which programs will be endorsed? Who should do it? How? Where? When? Resources allocated?)
C. Program Implementation and Recycling of Evaluation (What are the results of review and evaluation?)

The foregoing represents the outline of the initial institutional response to the requirement for program evaluation/accountability. In substance, the document emphasized that approaches to planning are not simple mechanical tasks. Although information systems technology has advanced at a rapid rate in recent years, the human implementation of these computerized tools reflects a studied approach relative to system utility and significance. Experience has shown that it is much easier to write computer programs such as the NCHEMS RRPM than relate them to some real university and carry them out. The format reflects, however, that there is a general framework within which evaluation can take place.

Political Considerations

In a university setting programs are, in a very real sense, the articulation of goals, priorities, and dreams of the faculty who are assembled to pursue and disseminate a particular field of knowledge. Thus, in the context of the human organization, program evaluation represents an oblique approach to the perennial problem of performance appraisal. A primary concern becomes the integration of individual needs and goals with more comprehensive organizational programs and objectives. As higher education institutions move to strengthen their procedures for institutional evaluation and the rationality of the decision-making process, it is especially crucial that plans include consideration of the needs and priorities of sub-units and individual professionals and means for their involvement in the evaluation process.

Obstacles to effective participation in the evaluation process fall into two categories: primary and secondary. Primary obstacles include poor planning, a limited investment in the development of the evaluation plan, a limited perspective of institutional needs, and a perennial conflict over both evaluation and institutional goals. Secondary obstacles include failing to recognize the human value in decision-making (i.e., the threat of change), a lack of sensitivity to professional needs and interests, the use of confusing jargon in evaluation, and poor communication in general.

The effectiveness of higher education institutions is ultimately determined by the collective productivity of individual faculty and staff working toward meaningful goals. Thus, individual professionals become the basic element of an effective program evaluation system. The contextual approach to institutional program evaluation must, therefore, incorporate human concerns as well as technical systems. Unfortunately, many program evaluation systems become counter-productive even before they are operationalized because little considera-

Figure 3

PROGRAM EVALUATION

Phase II
College/School Sequence

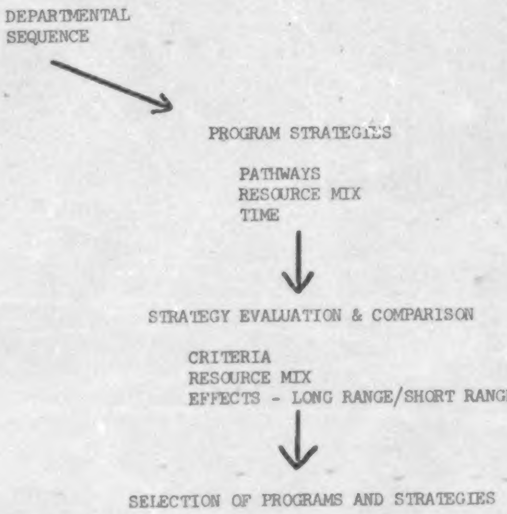
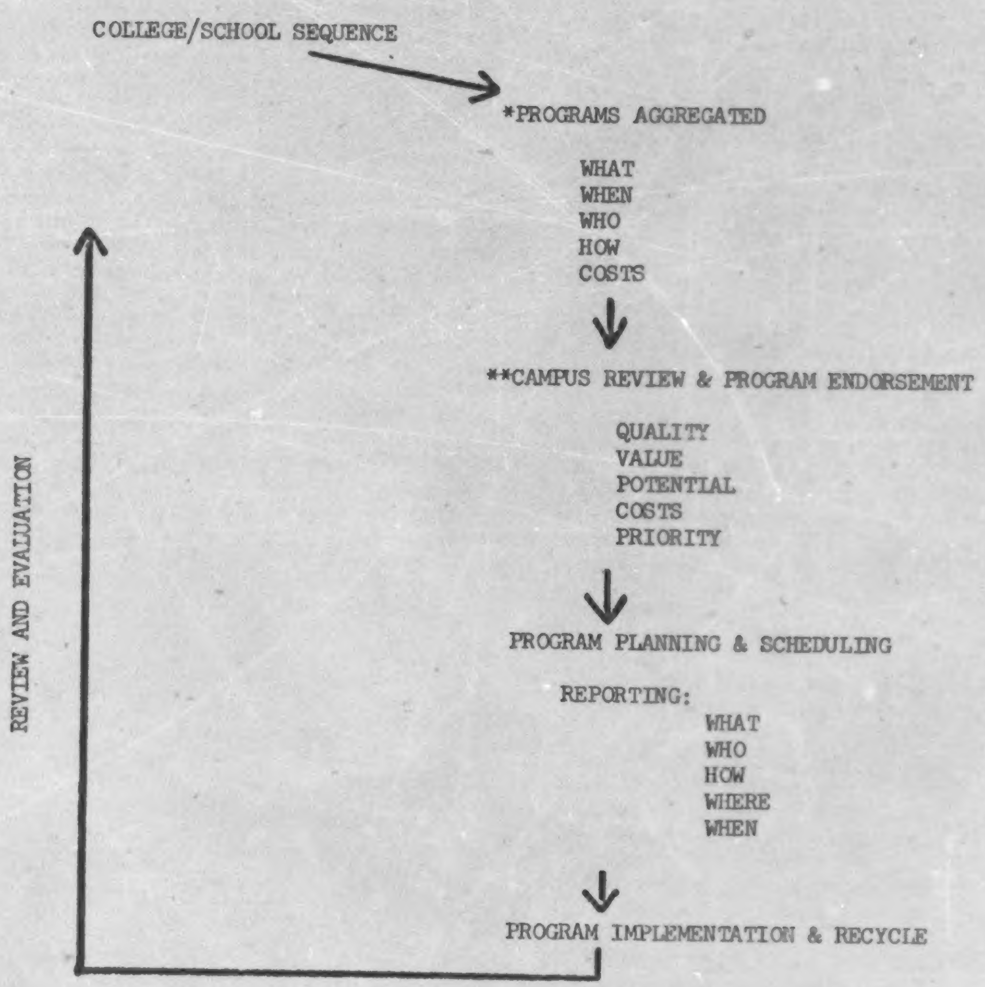

DEPARTMENTAL
SEQUENCE
PROGRAM STRATEGIES
PATHWAYS
RESOURCE MIX
TIME
STRATEGY EVALUATION & COMPARISON
CRITERIA
RESOURCE MIX
EFFECTS - LONG RANGE/SHORT RANGE
SELECTION OF PROGRAMS AND STRATEGIES

Figure 4

PROGRAM EVALUATION

Phase II
Campus Sequence


COLLEGE/SCHOOL SEQUENCE
*PROGRAMS AGGREGATED
WHAT
WHEN
WHO
HOW
COSTS
**CAMPUS REVIEW & PROGRAM ENDORSEMENT
QUALITY
VALUE
POTENTIAL
COSTS
PRIORITY
PROGRAM PLANNING & SCHEDULING
REPORTING:
WHAT
WHO
HOW
WHERE
WHEN
PROGRAM IMPLEMENTATION & RECYCLE
REVIEW AND EVALUATION

*NOTE. Involves campus modeling, utilizing student flow, cost analysis space utilization and productivity measures.

**Provides five-year forecast of campus operations.

tion is given to the projected human response to "invasion" by the system.

A system of evaluation, demanded externally but formulated internally, which is designed to collect, organize, analyze, and report information about space utilization, student numbers, cost benefit analysis, and resource allocation is doomed to failure if it does not pay significant attention to the nature of professional development, and those relationships, incentives, and dynamics of the socio-political (human) organization which contribute to measurable outcomes and broader consequences.

Conclusion

Our major concern, in the name of improved instructional effectiveness, must be with the establishment of some common understanding of what we wish to do, how we can proceed, and who must be involved with improved program evaluation. Even so, the jargon often feeds the conflict between consumers, evaluators, and professionals. The institutional critic who introduces program evaluation in the context of "retrenchment" is likely to receive less than enthusiastic response from the potentially "retrenched." The institutional researcher who accentuates expected values, cost benefit analysis, and student credit hours generated will probably create faculty resentment. Those who are to be affected by program evaluation and planning systems are quick to recognize threats to the status quo or the absence of non-quantifiable variables. Faculty who are affronted by systems or threatened by errors of omission are likely to distort input to the system or divert critical intellectual energy from primary research and teaching efforts to combating the "system." Consequently, creative contributions of human resources are disrupted and the integrity of the evaluation/planning system is distorted.

As governing boards and institutional researchers voice their concerns for improved program evaluation, the omission of human and value-oriented variables from existing systems becomes increasingly apparent to faculty at the program level. Thus, questions are raised relative to the value of a particular program element though it may be less "cost effective" than another. More significantly, when little concern is given to faculty development and rewards systems in program evaluation plans, faculty are quick to recognize an administrative commitment to efficiency orientations over the broader context of program effectiveness.

Progress will be made as a greater commitment is made to orientation and training of faculty in the technical aspects of evaluation systems, and designs are expanded to integrate the intervening human variables with outcome measures already given wide exposure. It goes without saying that external public interest groups and institutional researchers must continually be reminded of the value element of decisions, and be exposed to the essence and importance of value perspectives other than their own.

Institutional program evaluation is a process that necessitates full university participation. Most plans for program evaluation include a stated commitment to broad participation and involvement. Even so, many plans fall far short of success as behavioral commitment varies from procedural roles.

The need for broad involvement is well documented. Those most directly involved in a program are most likely to know its objectives and operational needs. From the broader perspective, if an institutional program evaluation system is to achieve legitimacy it must incorporate the values, needs, and perspectives of those ultimately affected by it. Broad participation is essential for optimal accuracy and validity of program information as well as general acceptance of feedback from the system.

The full impact of these considerations as well as the implementation of these activities has yet to be realized both as they relate to internal and external acceptance and utility at Iowa. At the present time the University is involved in internal education processes relative to the use and meaning of the proposed evaluation techniques. A timetable has been established wherein the processes involved would culminate in an academic evaluation and planning report to be submitted to State agencies as the guide for institutional resource requirements and allocations. The utility of the methodology remains under study, while external and internal offices and officers strive to better communicate their respective questions and answers concerning program evaluation.

Only time will tell whether or not the University has packaged an effective technique for the ongoing and vital efforts of program evaluation. It was Socrates who said that the unexamined life is not worth living; today in higher education it is also just too dangerous.

LINKING DATA TO DECISIONS: OPERATIONALIZING CONCEPTS IN INSTITUTIONAL GOAL DEVELOPMENT

Carl L. Harshman, St. Louis University

In the early 1960s, the technological advances of the first half of the century were not an integral part of management of higher education. Although industrial and economic organizations had adopted quantitative techniques for planning and management much earlier, higher education experienced a "technological lag." The reasons for the lag are not clear but could include: (a) the fact that as a fairly stable social/educational entity, higher education was not subject to the economic accountability which drives business and industry; (b) the demand for higher education had exceeded (at least during the 50s and 60s) the supply, which allowed institutions to be more concerned about who would be admitted than about what was done or how well; (c) social science research techniques were still in the infant stages.

The technological advances of the 1950s, the shift in supply and demand because of increasing institutional competition, and the lessening of resources brought about some significant changes during the sixties. Specifically, the Department of Defense's adoption of PPBS—programming, planning and budgeting systems—the increased sophistication of research design and statistical techniques and thrusts, especially in education, toward more complex approaches to evaluation predisposed higher education for coming trends. Again, there is no clearcut cause and effect relationship evident, but directions in the requirements for government funding, the shortage of new dollars, and the emergence of the era of accountability occurred in proximity to the quantification trends.

There is little question that during the last eight to ten years higher education has become far more systematic and quantitative in terms of internal organization and operation. The existence of the WICHE National Center for Higher Education Management Systems (NCHEMS), institutional adoption of management by objectives (MBO) techniques, foundation emphasis such as Exxon's Resource Allocation Management Program (RAMP) are but a few examples which support the contention.

During the same period organizational sociologists began seriously looking at the application of open systems theory and rational systems approaches to other than industrial-economic organizations (cf. Katz & Kahn, 1966; Kessel & Mink, 1971). In this trend was a concern for organizational goals.

Historically, higher education's goals were pretty much what Peters (1959) refers to as "high sounding ways of talking about doing some things rather than others and doing them in a certain manner" (p. 86). Although college catalogues and accreditation studies are filled with such platitudes to this day, in 1964 two sociologists, Edward Gross and Paul Grambsch, broke the rhetoric barrier with a quantified study of institutional goals in higher education. Their findings published in the book *University Goals & Academic Power* (Gross & Grambsch, 1968) started a trend in the empirical study of institutional goals which is gaining impetus annually. The quantification and analysis of institutional goals and the decisions linked to analysis are the focus of this paper.

Statement of the Problem

The study of institutional goals may serve a number of hidden agenda such as "beefing up" the institution at accreditation time, trying to make constituents "feel" that they have some input to the institution, and so forth, but there are sound, rational bases for the movement. These evolve from some basic assumptions about higher education as a formal organization:

1. Unlike some government agencies and various economic organizations in which goals, policies, etc. are established by fiat more often than not, colleges are more complex organizations which appear to be somewhat more democratic, or participative if you will, in their formulation and augmentation of policy.
2. Higher education serves a wider range of goals than most economic organizations or other social institutions.
3. Sound, rational planning and administration requires: (a) knowing where you are; (b) deciding where you want to be; and (c) choosing from among alternatives the best way to move from (a) to (b). There are, of course, other considerations such as priorities, but these will be discussed later.)
4. Valid, reliable, and useful information is an essential ingredient in fulfilling the criteria in (3) above.

The first two assumptions are used as justification for the need to study goals, the third for designing strategies in the study of goals, and the last for the kinds of analyses done and the interpretation of results.

The problem for this paper is addressed to the last assumption, the generation of data for decision-making. Specifically, the question is: Are the techniques used in the analysis of goals data adequate operations for the concepts under study and do they, in fact, yield the kind and quality of information desired for planning and programming in higher education? The question is concerned with the (social) scientific concept of operational definitions and with related analytical techniques—not their place in the study of goals, but rather their adequacy in achieving the research goal of valid, useful information for decision-making.

The question should be of concern to institutional researchers because they are often the agency which links data to decision-making. And, in pursuit of quality efforts, the focus on goals should concentrate on the distillation of data from the environment into valid, useful information.

Limitations

It is not the purpose of this study to look at the concepts of "process" versus "product" goals or of "official" versus "operant" goals (Peterson, 1970). Admittedly, these are important areas of study and ones which the work in the field to date have failed to encounter to the satisfaction of many who are concerned with the study of organizations. These concerns are, for the time, left to further research and other researchers.

Review of the Literature

The review is concerned with the identification of concepts addressed in the study of institutional goals and the techniques used to operationalize the concepts. Several studies were reviewed in order to gain a wide perspective on the work to date; however, the reader should not consider the review exhaustive. Essentially three types of literature were investigated: studies of and literature on goals in higher education, goals studies in schools, and research on the delphi technique.

The review of several goals studies revealed a number of operational concepts employed to greater or lesser extents. These are: priorities, divergence/discrepancy, congruence, consensus, and resource allocation.

Priorities. The basic approach to the empirical study of goals is to measure perceptions on the basis of the psychological dimension of *importance*. The concept of *priorities* means that some goals are more important than others. Priorities, in a decision-making sense, indicate that some goals are or ought to be given more attention than others (high priority) or less attention than others (low priority) with the possibility of categories between the two extremes.

There are three means of operationalizing priorities, all of which at some point result in rank-ordering the goals. The difference, it seems, stems from either the initial design of the study or from the type of measurement utilized. The first, used by Lipsitz and Rodgers (1972), takes the form of having respondents rate goals, then using the modal rating to create an overall rank order. A similar procedure, using a Likert-type response scale, takes the modal response as a percentage of the total responses to create priorities (Cyphert & Gant, 1970). The highest priority goal is one with the highest percentage of respondents for the highest modal value.

The second approach, based on ordinal assumptions, would use initial rank order data, i.e., respondents would rank *N* goals in terms of importance, to create a group rank order using, for example, the median rank for each goal as the delimiter. No studies using this approach were encountered due probably to the fact that recent goals studies contain more items than a respondent can reasonably rank.

The third and most common approach is to use a Likert-type response scale with assigned numerical values. These values, based on interval measurement assumptions, are data from which means ($\bar{X}$'s) are calculated. The means then are used to rank order goals on the basis of magnitude (Gross & Grambsch, 1968; Peterson, 1971; Tilden, 1973).[1]

It is clear that at least three approaches to creating an operational definition of priorities are possible and that the choice of technique is a function of type of measurement employed. The common ground for all methods is rank ordering as the method of operationalizing the concept of relative importance (priority). One other approach which does not involve rank ordering *per se*, was encountered. Gross and Grambsch trichotomized goals into high, medium and low priority on the basis of cutoffs at ± 1 standard deviation from the mean. This approach provides more workable sets (categories) of goals for the purpose of analysis and discussion, that is, it reduces the data to manageable categories.

Divergence/Discrepancy. The second concept frequently encountered is that of divergency or discrepancy. This kind of information is created to provide an indication of the difference in importance between the perception of a goal at one point in time (e.g. "is" or at present) and a respondent's values for goals in the future (e.g. "should be" or "ought to be"). The discrepancy is viewed as the "distance" or "gap" that needs to be reduced in order to create a stable, productive organization.[2]

There are two common approaches to calculating a divergency or discrepancy value. One, if only ordinal data are available or if the ranking from interval data are used, is to calculate the difference in rank order. The second, based on means, is to subtract the "is" or present goal value from the "should be" or preferred goal value.

If the only type of data for priorities are ranks, then the difference in rank order position is the only type of analysis that can be done. If, however, *means* are calculated, it seems better to use the numerical difference to operationalize the concept simply because the magnitude of the difference will be clearer. It should be pointed out that in a large majority of cases with interval data coming out of, for example, the IGI, there will be positive (+) discrepancy values because the "should be" mean is larger (more importance attached) than the "is" mean. In scanning a number of profiles in different IGI studies, it seems that there is almost what one might call a "standard discrepancy value" for goals. Figure 1 is a goals profile from Peterson (1971) in which the standard discrepancy has been shaded. There is no attempt or intent to make the notion a precise one. Rather, the point is to note that all goals (with an occasional exception) will yield a positive discrepancy. The concern, therefore, is not the existence of a discrepancy *per se*, but whether a given goal discrepancy appears to exceed or be less than the modal gap.

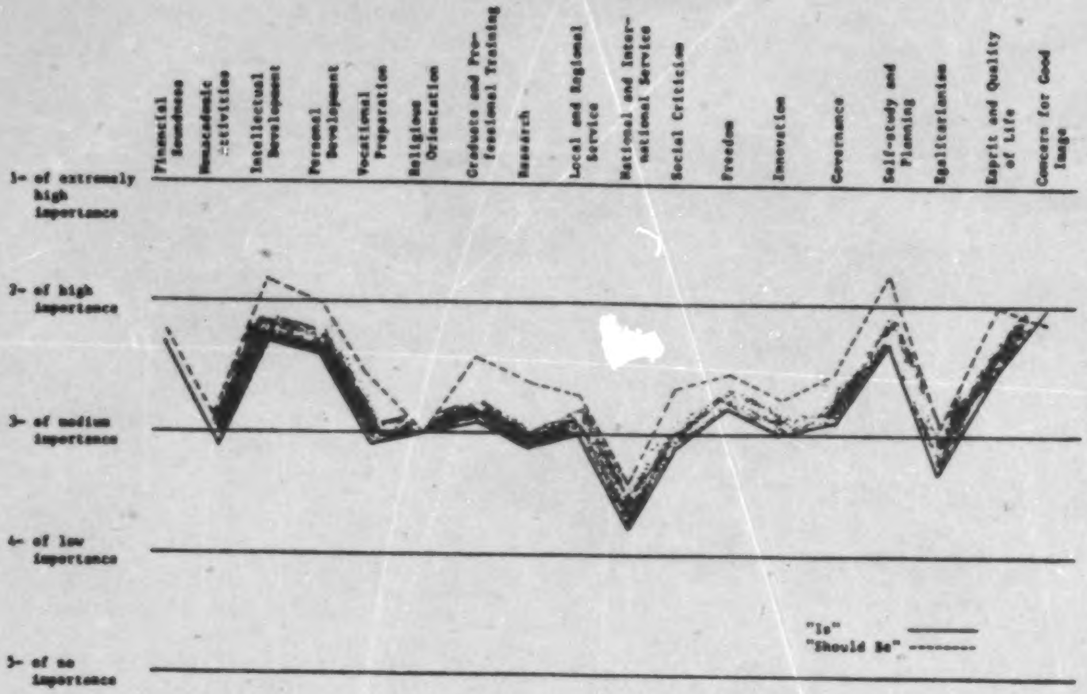
Congruence. Although the concept of congruence has been used interchangeably on occasion with the notion of discrepancy (described in the previous section), it seems equally if not more appropriate as a term which can describe the relationship between two patterns of goals (priorities). The question, "Do present institutional priorities differ from preferred priorities?", is one of what can be called congruence.

Of the studies reviewed, only one addressed the concept statistically. In a recent study (University of Houston, 1974) priorities for different groups on the IGI were compared by using Spearman's correlation coefficient (r_s). The same technique was used earlier in a study by Harshman (1972). The Spearman coefficient is a measure of relationship between two ranked sets of data. Gross and Grambsch (1968) make reference to congruence between patterns of goals but in terms of sub sets of the 47 goals. Gross (1968), for example, makes the statement, "In the case of seven goals, there is congruence between the actual position and the position that persons feel they ought to be in" (p. 531). The data for comparison were the respective rank order positions (or rather the fact that the same goal was ranked within the subgroup under both conditions). To wit:

> Four goals are perceived to be important and our respondents feel they ought to be important. . .
> The following three are at the bottom and our respondents feel that is where they belong. (Gross, 1968, p. 531)

Figure 1

INSTITUTION A: PROFILES OF "IS" AND "SHOULD BE" MEAN RESPONSES THIRD QUESTIONNAIRE; ALL CONSTITUENT GROUPS COMBINED (FROM UHL, 1971)



The Spearman technique is stronger than Gross and Grambsch's approach from the standpoint of overall comparisons, but the more informal approach of Gross and Grambsch is both workable and logical. If, however, the notion of congruence is taken to mean a comparison of the overall priorities (or even a subset of reasonable size), then it requires a significant "leap of faith" (or an operational definition) to infer congruence from only a description of ordinal data.

Consensus. The concept of consensus became popular in goals research as a spinoff of the work in the *delphi* technique at Rand Corporation (cf. Dalkey, 1969). The concept of consensus is concerned with the extent of agreement among respondents about importance but independent of the level of importance. That is, there could be more agreement about a low priority goal than about a high priority goal or vice versa. Priority *per se* has no effect except, of course, as a function of the possible range or distribution of responses in a positively or negatively skewed distribution.

Consensus is defined by Cyphert and Gant (1970) as the *modal response* to a goal (i.e., agreeing with the majority). Another approach, based on the definition that consensus is measured by variability, uses the *interquartile range* (IQR) as an index (when the median is the measure of central tendency). In one study the interquartile range is the measure of consensus and the reduction of this range in subsequent administrations of the goals instrument is called *convergence* (Alabama Institute of Higher Education Research & Services, 1972).

The common definition of consensus where the *mean* is the measure of central tendency is the *standard deviation*. This is the case in Gross and Grambsch (1968), Uhl (1971), and Harshman (1974).

The use of measures such as the IQR and standard deviation are reasonable definitions of consensus or agreement since variability of responses is the only index available for such an interpretation.

Resource Allocation. Only one author in the literature and studies reviewed made any statement about the creation of values for decisions about resource allocation. Peterson (1971) says:

> In deliberating, for example, how resources are to be allocated, one could argue that *both* what people want the college to accomplish (the *Should be* ratings) and how far the college has to go to get there (the *Should Be—Is* discrepancy) are important. (p. 11, italics his)

Basically, Peterson is arguing that resource allocation is a process designed to accentuate priorities but as a function of the discrepancy between where a goal is and where it ought to be.

Peterson calls the operational definition of this concept the "*Should be* plus Discrepancy" analysis. A value is created by summing a goal's preferred mean and the discrepancy score for that goal, thereby combining the values for priority and discrepancy. In his study Peterson only proposed the use of such a statistic and displayed a set of sample results based on data he used for discussion. No applications of this technique were found in the goals studies reviewed.

Conclusions from the Literature. It is evident that analyses in the studies reviewed tend toward simplified approaches. Modes or medians and interquartile ranges or means and standard deviations are calculated as the first step in analysis. These are usually converted to ranks. The use of the interquartile range or standard deviation as a measure of consensus is probably the best approach; however, it is not possible given only a mean and a standard deviation to tell how respondents are distributed. This may in some cases detract from the information available to decision-makers.

The only attempt to assess the difference between present and preferred goals rating is a discrepancy score.

Another concept encountered occassionally is goal congruence. Congruence is the relationship between present and preferred priorities. Although the concept has not been widely used, it should be useful as an indicator of the overall status of goals in the organization.

The use of statistics in education has created a struggle between analyses which are so complex that consumers or users are not able to understand what the data mean and oversimplified analyses which do not provide as complete and accurate a picture of the environment as might be possible and desirable. The remainder of this study is devoted to the presentation of analytic techniques which can be adopted in the analysis of institutional goals.

Operational Techniques in Institutional Goal Development

This section is devoted to a discussion of analytic techniques which help achieve the goal of a accurate picture of perceptions of institutional goals. The five concepts discussed are priorities, need, congruence, consensus, and resource allocation.

Priorities. Whether one is looking at present or preferred goals, there is a need to analyze the hierarchy of goals, i.e., priorities. The simple rank-ordering of goals on the basis of median points or mean scores does not provide as complete a picture as is possible. The major reason is that the distances between goals appear to be equal which they are not. Second, even if different medians or means exist, they may or may not be *statistically* different.

If the data are assumed to be interval, then a more accurate technique includes a one-way analysis of variance and, if differences are identified (i.e., a significant F-ratio), a multiple range test can be applied to the goal means. The technique was applied to goals data in a study by Harshman (1972). In all cases a significant F-ratio was found, allowing the application of a multiple range test to the means. (It is expected that nearly all goals data will yield significant F's and that a case in which a multiple range test could not be used would be extremely rare.) Of the three most popular multiple range tests available (Duncan's, Scheffé's and Tukey's), the Tukey test is the best. With Scheffé's test too many Type I errors are committed and with Duncan's too many Type II errors. The Tukey test falls between the extremes.

A multiple range analysis tests for statistically homogeneous subsets of means within a group as a function of various sizes. In the author's study a multiple range test was applied to a set of goals and grouped categories of means created on the basis of the resulting homogenous subsets (see Figure 2).

Figure 2

PREFERRED GOALS HIERARCHY DEVELOPED FROM THE TUCKEY b TEST

Rank	Goal	Mean	Homogeneous Subsets
1.	Individual/Personal Development (O)	4.34	A
2.	Community (P)	4.32	AB
3.	Intellectual Orientation (O)	4.15	ABC
4.	Democratic Governance (P)	4.06	BCD
5.	Intellectual/Aesthetic Environment (P)	3.95	CDE
6.	Student Development—Output (O)	3.92	CDE
7.	Innovation (P)	3.87	CDEF
8.	Freedom (P)	3.81	DEF
9.	Student Development—Process (P)	3.79	DEF
10.	Humanism/Altruism (O)	3.78	DEFG
11.	Vocational Preparation (O)	3.77	DEFG
12.	Academic Development (O)	3.76	DEFG
13.	Meeting Local Needs (O)	3.72	EFG
14.	Accountability/Efficiency (P)	3.71	EFG
15.	Social Egalitarianism (O)	3.60	FGH
16.	Public Service (O)	3.49	GH
17.	Social Criticism/Activism (O)	3.39	H
18.	Cultural/Aesthetic Awareness (O)	3.32	H
19.	Off-Campus Learning (P)	3.01	I
20.	Research (O)	2.77	IJ
21.	Advanced Training (O)	2.54	J
22.	Traditional Religiousness (O)	2.04	

[a] The means of goals in brackets are not significantly different.

[b] Table is from Harshman (1972)

Since Goal 1 is included in only "Subset A," it is safe to assume that it is more important than the other goals. Goals 5 and 6, however, are included in three common subsets (C,D,E). This means that they are somewhat less important than Goals 1-4, more important than the rest of the goals, but not significantly different from each other.

A preliminary report of an institutional goals study at the University of Houston (1974) notes that a one-way analysis of variance was used and, if differences were apparent, the Tukey or Scheffé Test was applied to test for differences.

The use of a multiple range technique provides the consumer with an accurate picture of the relative importance (to each other) of various goals. For the purpose of interpretation of data, it may be desirable to place the goals in more general categories of importance (e.g., high importance, medium importance, etc.). Even when this is done the existence of information on common subsets provides the necessary clarity to differentiate among individual or groups of goals.

Consensus. As described earlier, consensus is a concern because of the need to know the extent of agreement among constituents. The interquartile range is the reasonable measure of consensus when the median is used as the index of central tendency; the standard deviation appears to be the best available technique for indicating consensus when the mean is used. Previous studies talk of consensus as a measure of variability, not as a state of agreement. The difference is akin to the analogy of relative humidity, which is the proportion of moisture in the atmosphere in relation to what is possible. When the relative humidity is 100%, however, it is raining far more often than not (except in St. Louis, of course). That is, if the relative humidity is 100%, we can with some assurance say that it is raining. There have been few efforts at doing the same for goal consensus. The question, for the purpose of decision-making, is what amount of variability will we accept as evidence that agreement exists among respondents?

In an attempt to create a notion of consensus, one option is to establish a criterion. Gross and Grambsch (1968), for example, discuss a value of $\sigma = .90$ as the cutoff. An alternative approach for the purpose of decision-making might be to create what is analogous to the two-tailed test rejection regions in a normal distribution. In this manner a lower limit (e.g. $\sigma \leqq 75$) becomes the point below which consensus exists; an upper limit (e.g. $\geqq 1.00$) is the point above which there is not consensus. The area between .76 and .99 becomes the questionable region.

If a consensus/uncertain/no consensus approach using criterion cutoffs was chosen, the cutoff values might be selected from available goals data. In the University of Houston study, for example, the analysis of *Is* goals (IGI) for the total sample yielded the following:

Range of σ	*N Goals in Range*
.70 — .79	2
.80 — .89	14
.90 — .99	4
1.00 — 1.09	0

At the same time, the *Should Be* goals yielded the following:

Range of σ	*N Goals in Range*
.70 — .79	0
.80 — .89	4
.90 — .99	8
1.00 — 1.09	2
1.10 — 1.19	6

In the case of the *Should Be* deviations, none is less than .80. Over half of the goals have a σ of less than 1.00, however. For the *Is* goals all have σ's of less than 1.00, with 80% being less than .90. Depending on the assumptions employed and the judgements brought to bear, a set of limits such as the following might be adopted: $\sigma = .89\ \sigma$ consensus, ;90 - 1.09 = ?: $\sigma = 1.10$ = No consensus. At the same time, other data might reveal that these limits are too liberal.

A second factor in consensus is the shape of the distribution. It is expected that data for a goal will be normally distributed in most cases. It is possible, however, to create a bimodal distribution in which the mean and standard deviation are the same as those in a normal distribution. This kind of distribution has different implications than one which is normally distributed because the data indicate that perceptions are polarized. For example, a goal for *Public Service* could have a mean of 3.8 and a standard deviation of 0.8 and a goal for *Research* the same. When the distributions are displayed though, it is discovered that the *Public Service* goal data are normally distributed while the *Research* data are bimodal. Presumably, a decision consistent with the importance of the former goal will be accepted by most respondents. Assume, for example, that further analysis of the *Research* goal data reveal that faculty are polarized around disciplines with the natural and social science faculty placing high importance on research while humanities and business faculty feel it is of low importance. In this case, a commitment of resources to subsequent research activities will probably gain the approval of one group of faculty and elicit the opposite reaction from the other. The point is that the agency (e.g., institutional research) responsible for data analysis can provide additional valuable information by analyzing the distributions of goals responses.

Discrepancy as Need. No alternatives are suggested for the use of the discrepancy nor is an alternative form of calculation proposed. The only proposition presented for consideration is the use of discrepancy scores as definition of "need." The Battelle Memorial Institute (1972), in its *Survey of Educational Needs*, describes the concept under investigation as the difference between "what exists and what should exist." The use of the term need, as measured by the discrepancy score, is consistent with the pattern of concepts and operations proposed elsewhere (e.g., consensus [concept] is defined by the standard deviation [operation]).

Congruence. The question of congruence between the present and preferred priorities is less easily resolved. Entire sets of goals could be compared in one of two ways. If rank-ordering is done, a Spearman correlation (r_s) analysis will provide an indication of the relationship between the two sets of goals, i.e., (a) high positive correlation represents goal congruence and (b) no or a negative correlation indicates a difference in priorities (Harsham, 1972; Uhl, 1971; University of Houston, 1974). One major problem with this approach is that a few goals can be at radically different rank positions without affecting the correlation. This is considered to be a major limitation.

If you have interval data and statistics, a two-way analysis of variance (goals vs. is/should be) can be used to test for differences. The problem is that significant differences with a low probability of occurence by chance (e.g., $p < .01$) will nearly always be found (for main effects and the interaction of the two). The main effect for differences among goals is common and is the reason the multiple range technique is useful (cf. section on *Priorities*). The difference between "is" and "should be" is also common. For example, in an earlier study (Harshman, 1972), both an ANOVA test and individual t-tests between the means of 20 goals (IGI) resulted in significant differences in almost all cases ($p < .001$). Further, neither the ANOVA nor the t-tests provided useful information because the value was significant even when rank-order did not change.

If "should be" means are higher, as it is safe to assume they will be nine out of ten times in this type of instrument, then neither t-tests nor multivariate analysis will provide the user with additional information about overall goal congruence. Figure 1, taken from Norman Uhl's delphi, shows the "upward shift" in means which repeatedly creates statistical differences.

It seems that the only option, if the analysis capitalizes on interval assumptions, is to convert a respondent's goal means to standard scores on the basis of the grand mean for the data within one type of goal (is or should be). Then the standard scores for each individual can be treated as raw data and the analysis (e.g., t-tests) performed. The conversion of raw data has the effect of "equalizing" the two sets of data, i.e., subtracting out the tendency toward higher responses in "should be" scales. The individual goals within a given profile, however, maintain the same relative position as when the raw data are used. Even with this technique, the ANOVA will likely yield significant variance for both the main effects and interaction making the t-test between individual goal means the more reasonable statistic.

Resource Reallocation. The operational definition of needs as the discrepancy between two responses to the same goal statement is not challenged here. It is a valuable concept *if* the aim is to describe the present environment. On the other hand it falls short of being sufficient data, in and of itself, for the future planning and resource allocation (i.e., if an institution decided that the most resources ought to be applied to goals

Figure 3

A CATEGORIZATION OF GOALS BASED ON THE INTERACTION BETWEEN PRIORITY AND NEED

Need

Priority X= 3.75

	High D= 1.00	Low
High	(1) Individual/Personal Development (1) (2) Community (2) (3) Intellectual Orientation (3) (4) Democratic Governance (6) (6) Innovation (5) (8) Humanism/Altruism (4)	(5) Intellectual/Aesthetic Environment (7) (7) Freedom (5) (9) Vocational Preparation (11) (10) Academic Development (18)
Low		(11) Meeting Local Needs (13) (12) Accountability/Efficiency (14) (13) Social Egalitarianism (9) (14) Public Service (10) (15) Social Criticism/Activism (16) Cultural/Aesthetic Awareness (16) (17) Off-Campus Learning (12) (18) Research (17) (19) Advanced Training (19) (20) Traditional Religiousness (20)

( ) before the goal indicate the **priority** rank order
( ) after the goal indicate the **need** rank order
The figure was created from results in a study by Harshman (1972)

with the greatest need). The problem with need as the only piece of information comes about because of the argument that program decisions and resource allocation ought to be a function of both *importance and need.* This means that a goal with a large need index but, at the same time, which is only of medium importance may not deserve the attention and resources that a high priority goal with a lower need index might.

A potentially important kind of information is that which would help administrators make decisions about future areas of emphasis and resource allocation. There are some alternatives for creating this type of information besides the addition approach suggested by Peterson (cf. Resource Allocation). The first is a matrix created by breaking down rows and columns into categories of importance (priority) and need (discrepancy scores). Figure 3 is such a matrix. Here, the goals were divided into high, medium and low priority (rows) on the basis of an arbitrary dividing point for means (3.75). Column headings for needs were established by categorizing need indexes on the basis of a breaking point of D = 1.00.

These approaches satify the need in one way but fall short of the full potential of information. In order to provide the user with additional information a Resource Re-Allocation Index (RRI) is proposed. The RRI is calculated by combining the previously computed values for priority (*Should Be* mean) and used (discrepancy score) through multiplication. The formula is:

$$\text{RRI} = \overline{X}_{SB}(\overline{X}_{SB} - \overline{X}_{IS})$$

The index is computed through multiplication because addition has the effect of placing far more emphasis on importance than on need. By multiplying the two values, this imbalance is reduced.

In order to describe the differences between Peterson's approach (addition) and the RRI, a graph was created from data in a study. Figure 4 is from Tilden (1973). The solid line represents the "Should Be Plus Discrepancy" graph for 13 output goals using Peterson's data. The goals were arranged in order of increasing magnitude for the calculated value. The dashed line is the RRI for each goal for the same data. (The dotted line is the Should Be means profile.)

Two conclusions are evident from this graph: (a) the addition approach yields a flatter (accelerating more slowly) curve than the RRI; and (b) the RRI profile does not yield a larger value for each subsequent goal.

The implications of these findings are (a) that the RRI will spread the data more than the other technique making it easier to discriminate among the goals; (b) that the magnitude of values shifts with the RRI; and (c) that the addition approach more closely parallels the priority line than the RRI. The latter phenomenon is accentuated in the Tilden profile where one discrepancy score is negative (-.08) and another very small (.01).

Theoretically, there is no apparent mathematical problem with using either approach.[3] Perhaps a recommendation for one or the other can be made on the basis of argument. First, the similar shape and acceleration of the addition profile (compared to priorities) seem to add little information. If one allocated resources on the basis of priorities alone, for example, the outcome would not differ considerably from using the Peterson resource allocation statistic. That, however, is not the case with the RRI. Although the general shape of the curve is the same, some goals fluctuate radically.

Maybe the problem stems from the difference between resource *allocation* and resource *reallocation.* If one were opening a new institution, then priorities would be sufficient information from which to make allocation decisions (in fact, no data on discrepancy would exist because there is no "present"). On the other hand for institutions which are operating and allocating resources, the question is whether resources ought to be reallocated—that is, shifted from one goal to another. It is not clear whether the data apply differently to amount of resources and direction of shift (i.e., putting more in versus taking some away from), but reason tends toward the latter.

At the same time it is sound to reason that resources can (and sometimes should) be shifted on ground other than priorities alone. The Resource Reallocation Index provides information for such decisions by increasing the power of the need index.

Conclusions and Implications

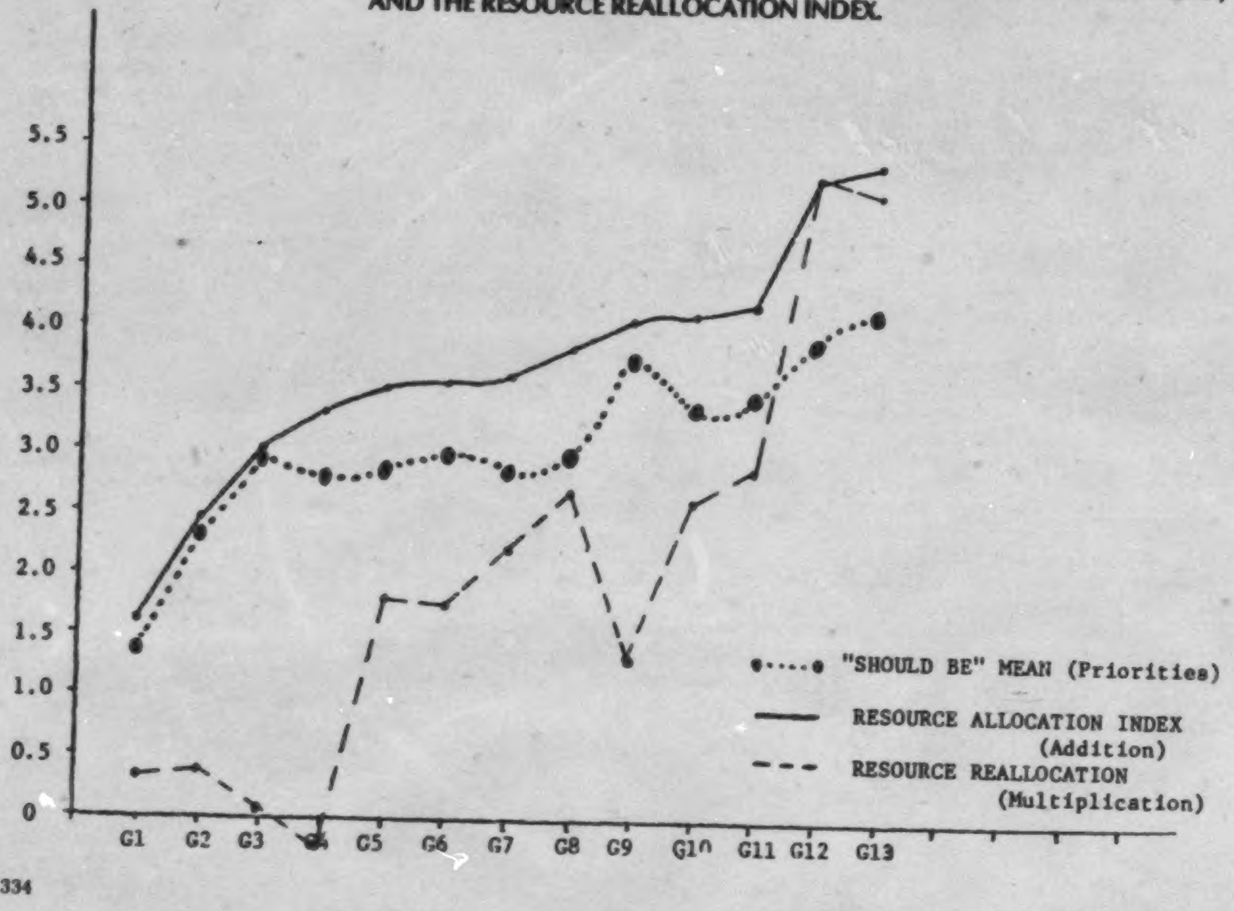
This paper began with the discussion of the increased emphasis on the study of institutional goals, especially the empirical thrust. Institutional goals have been operationalized through the development of goals instruments such as the *Institutional Goals Inventory* (ETS), sections of the *Institutional Self-Study Service* (ACT), and other locally developed instruments. In the process of doing studies of goals, a language which includes terms such as "priorities," "needs," "consensus," etc. has emerged. The practice has been to operationalize these concepts through analysis of goals data.

The problem, it seemed, was threefold: (a) at the outset some researchers made different assumptions about the type of measurement involved (e.g., ordinal vs. interval); (b) the same concept is operationalized in different ways; and (c) the tendency has been to use descriptive approaches to support inferential decision-making processes. The paper viewed several techniques used in various goals studies. A later section looked at each concept (e.g., priorities) and supported techniques used, expanded on them to increase their utility, and recommended alternative operations.

Treating the recommended operations as truth theorems would be an error of immense proportion. At best they are reasonable guesses. If there is immediate value in the analysis and recommendations, it is to present institutional researchers and decision-makers with an analytic framework for the study of institutional goals and with definitions for linking data to decision-making processes. It is hoped that the discussion and research which follow will both challenge the assumptions and narrow the pattern of our "shotgun" approach to language and research on institutional goals.

Figure 4

A COMPARISON OF GRAPHS FOR PRIORITIES ("SHOULD BE" MEANS), A RESOURCE ALLOCATION INDEX, AND THE RESOURCE REALLOCATION INDEX.



[1] In the Institutional Goals Inventory (versus, for example, Gross and Grambsch) two kinds of priorities are possible. One is based on individual goal statement values. The other is what Peterson (1972) calls a goal area mean (GAX), an example being "Academic Development." Each of 20 goal areas is computed from four items. In this case, each respondent's item values are summed and a mean calculated. The GAX, then, is a mean of means for all respondents.

[2] The assumption about low discrepancy is often encountered but little discussed. There are some organizational theorists (e.g., Robert J. Silverman) who seriously entertain the notion that some degree of discrepancy is necessary for vitality, i.e., to keep the organization moving toward something. For here, it is sufficient to say that researchers ought to take some care in putting values (good/bad) on discrepancy data when interpreting results.

[3] The author is indebted to Dr. Edwin G. Eigel, Jr., mathematician and Academic Vice President at Saint Louis University, for his counsel on this question.

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OPERATING STRATEGIES FOR DELPHI EXERCISES

Robert Judd, Troy State University

It would be tempting to claim that Delphi exercises, like Caesar's account of the war in Gaul, can be divided into three parts: conception, execution, and analysis. Such an account may be sufficient for description of the "grand plan," but is woefully insufficient for the detailed operations associated with a Delphi undertaking of even the smallest size. As size of a Delphi panel increases, so do the complexities. But even a Delphi of a dozen respondents poses certain irreducible requirements of the analyst who proposes to conduct the exercise.

Seven Operational Requirements

These requirements are at least seven in number. They are:

1. Conception and development of the question or problem to which the Delphi exercise is to be addressed
2. Round Zero Elements
   a. panel size
   b. panel composition
   c. creation and dispatch of request to participate with response material
   d. decision on nature of Round One inquiry including pretest
   e. creation of overall time frame expectations (PERT, *et al.*)
3. Round One Elements
   a. creation and dispatch of Round One instrument with instructions, return provision, and deadline
   b. detailed recording of response curve rate, assembling of machine capabilities, line-up of Round One editing personnel, and supplies
4. Editing Initial Responses
   a. process requires editors, delphi analyst, and typist
   b. preconceived notions of length or degree of detail in Round Two instrument to be avoided
   c. there are no short cuts to completion of the task. One or more solid eight hour days are required until the job is done.
   d. creation of the Round Two instrument as to format and its pretesting is recommended before final printing and dispatch to the Delphi panel.
5. Second and Later Rounds
   a. the function of each later round is to provide an opportunity for panel rating of the instrument their Round One responses, as edited and returned to them, brought into being. Typically such rating involves questions of timing and questions of values.
   b. each round will typically require specific instructions for its execution by the Delphi panel and each round should provide specific feedback of the respondent's previous answer in the context of the panel answer.
   c. it may be felt useful to invite comments from panel members who hold divergent opinions; however, these may be defined by the Delphi analyst. Where such views are invited it is incumbent on the Delphi analyst to reproduce these comments in some form of a Minority Report as his minimum response.
6. Summary Round Report
   a. at some point, to be determined by the Delphi analyst, there will be no further response sought from the panel and the summary of the previous round will close the Delphi exercise.
   b. there may be additional data that can and should be furnished the panel participants at this time, but under no circumstances should this Summary Round Report be delayed to permit full analysis
7. Analysis and Final Report
   a. the extent of analytic possibilities will be governed by the nature of the problem addressed, the size of the panel and the number of iterations undertaken.
   b. at the very least some account must be taken of the degree of initial agreement or consensus and the direction and velocity of its movement subsequent to Round Two.
   c. it would be helpful to better Delphi practice in future inquiries if every Delphi analyst would make some appropriate effort at publication of the outcomes of a Delphi exercise. It is obvious that there are many Delphi efforts that have very sensitive subjects as the object of the inquiry. Nevertheless, good practice can only arise from objective sharing of the non-sensitive essentials of any Delphi exercise.
   d. obviously the nature of the final report will vary with the audience addressed. A one-page recommendation to a senior administrator may suffice or the findings may encompass 200 or more printed pages addressed to a national audience as in the case of a recent study (Huckfeldt, 1972).

Time Factors in Delphi Operations

One of the few published sources on Delphi operations (Delbeca, *et al.* 1975) divides the process into ten activities and suggests the time needed for each activity. Adapting that outline to the seven steps proposed above yields the following:

APPLIED TIME FACTORS

Conception and development	- ½ day
Round Zero Elements	- 2½ days
Round One Elements	- 10 days
Editing Initial Responses	- ½ day
Second and Later Rounds	- 24 days
Summary Round Report	- 2 days
Analysis and Final Report	- 5 days
Total Minimum Time	- 44½ days

Experience of the writer with a number of Delphi exercises suggests that the conception and development stage will require a great deal more time than this guideline suggests. Moreover, editing of initial responses just cannot be accomplished in a half day and involve the kind of process that takes as input the exact words of the Delphi panel respondents and seeks to codify them into a reasonable list of factors for Round Two response. In this connection it may be instructive to examine the time schedule of the largest and most complex Delphi exercise known to the writer at this time. This is the work of National Center for Higher Education Management Systems at the Western Interstate Commission on Higher Education (NCHEMS at WICHE) referred to earlier. Their master time schedule called for beginning Round Zero activity on December 8, 1971, and ending it on December 23 for a total of 12 working days. Round One was allocated nine working days. The editing process consumed six days. Round Two began on January 17 and ran for 16 working days. Round Three was planned to take 15 working days, as were Rounds Four and Five. The Summary Round Report was programmed to take ten working days. This represented a grand total of 98 working days, a few of which it can be admitted were Saturdays and Sundays. Now this time frame should be understood in the light of the extensive automation which NCHEMS brought to bear on the project. As has been reported at an earlier Association for Institutional Research session (Judd, 1972), the tabulation was handled by a computer program. The computer output was formatted, then microfilmed and finally printed as the necessary outgoing Round Instrument. The time schedule recited above gives no account to the conception and development stage. The earliest record available to the writer makes it evident that conceptualization was well along in the first week of November, a full month before commencing Round Zero activity. One of the components of any time schedule has to be transit time for the outgoing instrument and then transit time back to the Delphi analyst. Where respondents are part of the same campus, one day out and one day back plus the estimated time for panel member response will be a viable estimate. Where a national structure of panel membership is involved, even with airmail utilization as in the NCHEMS Delphi exercise, the outgoing and incoming mail times were allocated five calendar days. This was not always enough judging by postmark comparisons with dates of receipt of the incoming mail.

Factors in Delphi Exercise Analysis

Implicit in any analytic effort is the data base involved in the specific Delphi exercise undertaken. The NCHEMS Delphi had a data base of these dimensions:

NCHEMS DELPHI DATA BASE

385	panel members
118	change statements
11	questions
9	groups in two questions
21	categories of relationship to postsecondary education.

Dr. Robert Wallhaus, the Director of Research and Development for NCHEMS, reported at the May 1972 AIR Forum in a set of slides giving preliminary findings (which unfortunately did not become part of the Proceedings of the Forum session) on the NCHEMS Delphi exercise. In just 7 slides of highlights on which the writer has a record, there were 186 relationships in data analysis reported.

In the face of the potential complexity of the analytic process, perhaps some guidelines would be useful: First, the results of any Delphi should be analyzed in terms of the answers to the problem or question that generated the project. Second in importance would be analysis of group characteristics found in respondents with particular responses. This is important to conclusions about behavioral change or lack of same. It is also very important to understanding more of the Delphi process. Third in analytic importance would be a tie between (a) analyzing individual panel member responses over a series of rounds or (b) analyzing panel member participation or lack thereof over the several rounds. Whichever is chosen as third in importance is of lesser importance than the fact of carrying through all four phases of the analytic effort proposed.

In a very small Delphi (reported in a forthcoming article by the author) the urgency of discovering the relatively few key reasons students and faculty favored a change in the time schedule of a private college was paramount. Secondarily, it was very persuasive to the Administrative Council to discover that certain constituencies were preponderantly favorable to the propositions that emerged as the "consensus," and these constituencies had exhibited this favorable view from Round Two onward. Only as Round Three closed did two less important components of campus life begin to express a similar favorable view of the proposed change and reasons therefore. In this instance there was no attempt to distinguish between (a) the group characteristics of respondents with particular responses and (b) analyzing individual panel member responses over several rounds. With a small panel (of only 45) the two otherwise discrete analytic stages became one.

There is an unresolved issue in every voluntary Delphi on record. This is the issue of non-participation in one or more rounds. Current practice favors continuing the opportunity to each original panel member to participate in each new round whether there was participation in the previous round or even in any previous round. In the original use of Delphi as proposed by the Rand Corporation there was the assumption that all panel members would be (a) experts, (b) paid an honorarium for their efforts, and (c) expected to give immediate and faithful attention to each round as it came to their desks. The man who pays the piper does truly call the tune. But what of the Delphi analyst who does not pay any panel member? There is next to no likelihood he can call the tune. Thus analysis of participation, even as the fourth ranked analytic priority, is a genuinely mandatory analysis to undertake.

What of the Future?

When the workshop of which this paper is a part was in a planning stage, there was speculation about the wisdom of providing a Delphi exercise to workshop participants on the "future use of Delphi in higher education." This might have been a propaedeutic learning experience for all participants. Yet it seemed better to leave that question to be answered by the action realities of the coming year. The extent of interest in Delphi suggests that it is more than a fad. Consensus about Delphi in higher education will be the product of the extent to which it is used.

Delbecq, A. L. *et al.*, *Group techniques for program planning.* Glenview, Ill., Scott, Foresman & Co., 1975.

Huckfeldt, V. E. *A forecast of changes in postsecondary education.* Boulder, Colo., NCHEMS at WICHE, 1972.

Judd, R. C. Delphi decision methods in higher education administration. In C. T. Stewart (Ed.), *Reformation and reallocation in higher education.* 12th Annual Forum of the Association for Institutional Research, 1972, Claremont, CA, 1972.

A FOLLOW-UP OF A DELPHI STUDY

Norman P. Uhl, North Carolina Central University

As indicated in an article by Judd in *College and University Business* (1972), the Delphi technique is being used by more and more institutions of higher education as a tool to obtain consensus. A few of the areas in which it has been employed to encourage consensus are identifying college, universitywide, and statewide educational goals and objectives; curriculum and campus planning; studies of cost effectiveness and cost-benefit analysis; rating scales and other evaluation procedures; educational goals and objectives for the future; and studies of resource allocation.

While most of the Delphi studies obtained convergence of opinion after two or more rounds, none of the above studies investigates the permanency of this opinion convergence. When consensus is achieved, does it represent a *real* shift in attitude or perception on the part of the individuals who changed their responses or are the changes only of a temporary nature.

Method

To investigate this question, 26 faculty who had participated in a Delphi study of goals conducted by the author (Uhl, 1971) were given the identical questionnaire one year later. This questionnaire asks for their present perceptions of the degree of importance given to different goals by their institution as well as what degree of importance they think *should be* attached to each goal. Thus both perceptions and attitudes are assessed. In the original study, participants converged in most goal areas from rather diverse opinions on the first round to general agreement on the third round. The question of interest here is whether their responses to the first or last round of the Delphi will be closest to the responses one year later. If the responses are closer to the first round, it would provide support for the argument that the Delphi process (as used in this goals study) does not have a lasting effect, whereas the opposite results would provide support to the hypothesis that a real shift in attitude and/or perception does occur.

Each participant's responses to the 110 items in the questionnaire given one year later were compared with that individual's responses to the 110 items on the initial questionnaire and on the final questionnaire. Absolute difference scores were calculated and compared (responses to the questionnaire given one year later minus responses to the initial Delphi questionnaire were compared with responses to the questionnaire given one year later minus responses to the final Delphi questionnaire). Since the items of the questionnaire were divided into 18 goal areas, it was possible to obtain difference scores per goal area by summing the appropriate item difference scores. The statistical analysis compared the two difference scores for the 18 goal areas. This involved two separate analyses (using Linquist's treatment by treatment by subjects design): one used the difference scores from ratings of present importance, while the other used difference scores obtained from ratings of preferred importance.

Results

In both analyses it was found that ratings of importance obtained one year after the Delphi study had been completed were more similar to the ratings given on the initial rather than the final Delphi questionnaire. (The two difference scores were significantly different at the .05 level.) In addition, there was a significant interaction between these difference scores and the goal areas. Upon examination of the cell means, it was found that this interaction was caused by a few goal areas (3 of the 18 goal areas in the present importance analysis—Personal Development, Vocational Preparation, and Research—and 4 of the 18 in the preferred importance analysis—Personal Development, Research, Social Conscience and Esprit and Quality of Life) for which the responses to the questionnaire given one year later were more similar to those responses to the final than the initial questionnaire.

Discussion

The content of the few goal areas which were exceptions were reviewed but did not offer an explanation for their differing results. In general, the results provide support to the hypothesis that, in this goals study, the changes in opinion as a result of the Delphi technique were only of a temporary nature. However, before these findings can ge generalized, one must consider the limitations of the present study.

1. The subject of the study was present and preferred importance ratings of goals. It is possible that similar results would not be obtained with other subject matter.
2. The participants were limited to faculty.
3. Twenty-six faculty is a relatively small sample.
4. While the results of the original Delphi goals study were used in institutional planning, most of the faculty included in this follow-up study did not participate in this process of planning, and therefore have not come in contact with the results of the Delphi study during the year prior to this follow-up study. Different results might have been obtained if the faculty were using the results of the Delphi study or if the administrators who were responsible for the planning had been included in this study.
5. If the follow-up study had been performed after a shorter time interval (e.g., six months), different results might have been obtained.
6. The study was conducted at one institution. Institutions with different characteristics might obtain different results.

7. Some studies have indicated that certain personality characteristics of the respondents affect the degree of convergence obtained. No attempt was made to assess these variables.

While this study does not provide a definitive answer to the original question of the permanency of response changes as a result of the Delphi technique, it does indicate that this is likely to be a fertile area for additional research. Certain variables have been identified which should be considered in such studies. Since the Delphi technique is being used rather frequently, such research will have important implications for the use of this technique in higher education.

Judd, R. C. Forecasting to consensus gathering, delphi grows up to college needs. *College and University Business*, July, 1972, pp. 35-37.

Uhl, N. P. *Identifying institutional goals: Encouraging convergence of opinion through the delphi technique.* Durham, N.C.: National Laboratory for Higher Education, 1971.

DELPHI REVISITED

Robert J. Parden, University of Santa Clara

Three years ago, the University of Santa Clara's Community Council sought to arrive at a consensus on institutional priorities using a modification of the Delphi technique (Parden, 1972). It is now possible to assess the impact of that procedure. Further refinements in the application, the role of consensus teaching techniques in the decision-making hierarchy of the university, and current applications in resource allocation will be discussed in these comments.

The Delphi application, undertaken three years ago at Santa Clara, included the administration of an institutional goals inventory to the 36 member University of Santa Clara's University Community Council, composed of students, faculty and administrators. The need for an institutional priorities ranking became evident when the council sought to review and approve the annual University budget. The debate over resource allocation quickly focused on institutional priorities. Before resources could be allocated, it was necessary to reach agreement on institutional priorities.

It is not clear, entirely, whether or not the procedure which evolved should be given the Delphi label. The goals of the procedure, however, are the same. The Delphi technique was developed to overcome the same kinds of group interaction constraints that have arisen in many university committee situations as the result of broader governance participation. These are described by the Rand group:

1. To reduce the tendency of high ranked members of a group to intimidate the others and to inhibit valuable exchange;
2. To allow leisurely consideration of proposals and counter proposals, written evidence, and arguments which the dynamics of group meetings shroud in words and noise;
3. To allow persons to switch positions based on the logic of the arguments, without "losing face" by appearing indecisive because of a premature judgment (Dalkey & Helmer, 1969; Helmer, 1966; Dalkey, 1969).

The selection of university committee memberships often overlooks the management maxim that those who are directly related in the organizational hierarchy should not hold membership on the same committee. Member B, for example, is hesitant to directly contradict or oppose member A, who is his boss. However, it is not uncommon in the academic scene to find vice presidents, deans, faculty members and students, all participating in debates about priorities which may have a major impact on the programs for which one of the committee members is responsible. Hence the attractiveness of the Delphi Technique—the feature of anonymity.

A Second Look at Institutional Priorities Ranking

Santa Clara's initial experience resulted from the University Community Council's debate on the sequence in which proposed new buildings would be erected. This need for additional facilities and their priority related to the priorities given to the programs in which the buildings were to be housed. It was anticipated that considerable time would be required for each of the 36 council members to express their opinions and then debate all of the alternatives. There was a need for a mechanism to develop a ranking of goals in an orderly fashion. The Delphi technique offered this potential.

Three years have passed, and our experience will be helpful to those using this approach:

1) There were errors in selecting items when we composed the initial inventory. We mixed university objectives and goals together (if there is a difference) and they should have been included in separate inquiries. Long-range objectives are classified as those kinds of statements that appear in the front of the catalog, and against which new institutional directions might be evaluated. You do not, however, expect them to become the focus of an action program. Examples of objectives, from the Santa Clara instrument, would include:
   - —Achieve identification as the small, selective, Catholic university
   - —Develop an administration-student communication of major policies

   Goals which would encourage, and did provoke, immediate action included:

   Ranked as Important

   Develop a coordinated program for budget review.

   Develop more sophisticated methods to identify superior teaching.

   Evaluate a variety of meal plans for students.

   Ranked of Little Importance

   Increase support of the present counseling center.

   Establish a San Francisco center.

   Establish a university-wide governing board.

   Why the concern for mixed objectives and goals? The inventory instrument gets too long. The participants become leery of the next reiteration. Participation may fall off. If the central purpose of the activity is carefully defined, the number of items in the ranking instrument can be reduced.

2) We did not experiment with an open-ended question such as "Rank your university program priorities to include the four currently under discussion (theatre, classrooms, health center, and student activities center))." We believed this would require too much time.

Impact

Did anything happen as a result of the listing of priorities using the Delphi technique? Yes. The financial support of the University's counseling center was immediately decreased. The vociferous support of a proposal for a San Francisco Center disappeared almost immediately when the Council ranked it of little importance. A suspicion that there was little interest in a University-wide governing board was also immediately confirmed and the discussion ceased.

What can be generalized from this experience?

1) The ultimate purpose of activity must be clarified and the breadth of inquiry restricted.
2) The need for previewing with the participants the implication of inventory statements cannot be over-stressed. The greater the familiarity each participant has with the ramifications of every statement, the more confidence you will have in the results.
3) It is a fast way to get a group consensus, to get something down on paper, to focus the debate.
4) The ability to arrive at a consensus should not be confused with the ability of a group to achieve implementation of the program on which there is consensus. This should be obvious, but it was not to those of us who initially proposed this approach.

Delphi—A Means and Some Distance from the End

When I first read of the Delphi technique, I thought I had finally found gold. In the early seventies the campuses were staggering from one posture to the next seeking a new stability. I shared the strong feeling that members of the University community were operating at cross purposes, and that more energy was being spent seeking consensus than was directed toward education. Therefore, if a consensus could be reached on purpose and direction, the energies of the entire institution would be focused on redefined, common goals. I assumed consensus was synonymous with achievement, and it was not and is not.

The first element adding to my confusion about the Delphi techniques program was noise. There were enough voices proposing alternatives that one assumed that the institution had come to a halt while listening and waiting for consensus. For example, there had been considerable agitation to open a San Francisco Center in the style of Antioch. The message then grew louder that Santa Clara was no longer capable of responding to brave new proposals for change. In the ranking of institutional priorities by the Community Council, however, the San Francisco Center was ranked of "little importance." It then became clear that this particular activity was being encouraged by one particularly effective lobbyist who was living in San Francisco and searching for an alternative to the 46-mile commute. The Delphi technique identified the strength of the signals being sent.

More important than the noise factor is the error made in endowing the Delphi technique with the ability to mandate implementation. In this connection, it is well to remember the effective uses that can be made of councils and committees. They can review coordination; they are less effective for implementing a specific program. Specific programs are best implemented by a person who is given that authority and responsibility. The enthusiasm for the Delphi technique, for identifying consensus, must therefore not be confused with the leadership, inspiration, motivation, and drive that are necessary for goal attainment. This is perhaps more critical in the academic environment than in the military or business activity. In the university there are many alternatives which can be identified with success. For example, few institutions offer degrees in all possible academic disciplines. The choice of which ones to pursue does not respond to any set of absolutes. Many programs are successful because of the people involved in their attainments. It is possible for group consensus to give a high priority ranking to an activity or program, yet the program will falter because there is no one to follow through. This should admittedly be one of the considerations of those doing the priority rankings, but they may be using absolutes for their judgments.

A final observation on our earlier experience: It should be remembered that the consensus of a group obtained by the Delphi technique gives no more political stature to the group (despite the "scientific approach") than does any other technique, such as a majority vote.

The 36 members of our University Community Council express the opinion of 36 people. The students are elected to membership but do not stand for reelection. The students, faculty members or administrators rarely canvass their constituents. This observation is true for many university committee activities. The Delphi technique is a consensus of that group only and is representative of the entire university community only to the degree that the group is representative.

The need for consensus continues. Decision-makers should know the position of "representative" groups, even if the consensus of the group does not become policy. Often it may. With the growing concern for resource allocation, I will close with a description of our current activity which indicates our continuing interest in the Delphi method.

The Delphi Technique for Resource Allocation

Santa Clara has a budget committee, headed by the vice president for finance, which is advisory to the president. The president therefore, need not listen to the group consensus if he chooses not to. On the other hand, with the keen competition for limited funds, he may wish to have an additional evaluation, independent of that of his own staff officers. While Santa Clara has been fortunate in not yet needing to face a deficit situation, we are seeking to develop organizational procedures to support resource allocation decisions that may become more restrictive. Our initial activity includes a composite of the Delphi technique and zero base budgeting.

This year a million dollars in additional support was requested for programs, with only $200,000 available for additional support. The budget committee is composed of three vice presidents, three deans, the controller, six faculty members, and three students. To help each member of the group better understand the implications of the choices to be made, supporting documentation included:

1) the name of the activity of program,
2) the amount requested,
3) the impact on the program if support was granted,
4) impact on the program if support was denied,
5) supporting statistical analyses.

Since there were 60 requests to review, there was a need to condense the original, supporting documentation to sustain the interest of the original members of the budget committee. The condensed supporting documentation for each program was reviewed by the group as a whole with questions answered, and additional data obtained when requested. Each member of the group then ranked each item on a 20-point scale that accomodated importance and urgency. Urgency of the request was reflected in an item such as increased support to accomodate rising utility bills.

The group rankings were then compiled. Because some of the requested support related directly to members of the committee, the Delphi confidentially was appropriate. The group then reviewed the allocation "winners" in their rank order, and priorities were reconsidered to see if "further convergence" could be obtained. This was the approach used this year when only the surplus was being assigned to priority needs. The next step is to extend this approach to review all existing programs and prepare for reallocation. The approach developed for next year is to arbitrarily reduce the funding of all programs to an 80% level. Then the priorities for restoration or for new requests will be developed using the Delphi method.

Summary

The Delphi technique works very well if it is used for its intended purpose. It is an effective, fast method for reaching a consensus of a group when the power structure relationship of the participants inhibits candid discussion. In addition, if an adequate number of reiterations are undertaken, it forces prolonged consideration with adequate supporting material. This is not typical in most non-structured decision-seeking group meetings. Finally, it must be remembered that it is a consensus seeking technique, not an implementation mechanism. All of the problems of institutional strategy and organizational effectiveness remain. The Delphi technique points the way and reduces extraneous noise. It does not provide the essentials of leadership, enthusiasm, and drive.

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Parden, R. J. The Delphi technique modified for establishing institutional priorities as a prerequisite to resource allocation. *Proceedings of the 12th Annual Forum*, Association for Institutional Research, 1972, p. 106.

A TWO TIME USER LOOKS AT THE DELPHI TECHNIQUE IN HIGHER EDUCATION

W. Keith Evans,
Portland State University

The classical model of the Delphi method, a product of the Rand Corporation brain trust, is focused toward decreasing divergent opinions and emerging with some representation of group consensus. Classical methodology generally dictates many iterations in order to hammer out consensus—often, in my opinion, by wearing out the respondent. Specifically, the procedure includes repeated responses to a short statement Delphi questionnaire, each successive response designed to narrow the gap between agreement and disagreement. The respondents are given feedback between each round indicating where their answer stands in relation to the average of all responses. Each repetition gives the respondent the opportunity to modify his previous response (presumably toward the majority response). Often there are four or more repetitions in a Delphi procedure. (For a more complete description of classical Delphi methodology see The Rand Corporation (1971), Dalkey & Helmer (1963), and Dalkey, Rourke, Lewis, & Snyder, 1972.)

The typical setting for a Delphi exercise varies considerably. However, in general Delphi has been used primarily in the business/technical world, and in particular, in a planning or forecasting setting. How then does one deal with not only a non-business/technical audience, in this case university faculty, but also an audience which has serious reservations about techniques like Delphi and to whom planning often appears antithetical to the academic enterprise? The answer, as laid out in this article, is—carefully and flexibly.

The use of Delphi in higher education has not been extensive, although, as some researchers suggest, published discussions may be limited by users not wanting to reveal sensitive institutional issues which were the subject of the Delphi exercise. Because of the sensitivity of university audiences and perhaps even their intrinsic adversity to techniques like Delphi, there are two important questions the answers to which could strongly influence success. The first question asks whether achieving consensus is the only valid objective of a Delphi experience. The second question asks whether the classical Delphi paradigm can or should be modified.

As to whether Delphi must focus on consensus, Judd (1972) points out that Delphi is gaining recognition for other virtues such as pointing out divergence of opinion. On the second issue, Judd (1972), Jacobson (1970), and Hudspeth (1970) disagree about the need for integrity in the Delphi process. Jacobson apologizes for tampering with the classical Delphi paradigm, while Judd and Hudspeth appear to encourage it.

The two experiences reported here, from the outset, were designed with the recognition that changing the Delphi paradigm would be necessary. Clearly, because of the nature of the participants (as will be described later, the suggestion to use Delphi was met with highly mixed emotions), classical Delphi procedures would have been counterproductive to achieving the goals desired. Principally, the objective was to illicit a coherent and focused direction for group discussion. Consensus was not an objective, and, if consensus was to be achieved at all, it was to be achieved through discussions following the Delphi exercise rather than as a product of the exercise.

In two situations, which will be the case studies contained in this article, the need and rationale for a Delphi approach arose out of frustration. The frustration was caused by the inability of a group of university faculty and administrators to focus a productive discussion on the issues which brought them together. In both cases the suggestion to use techniques like Delphi to help synthesize the discussions was met with either neutral or negative reactions from the groups. Their ultimate acquiescence to participating resulted from (a) discussions insuring them that the process was not as dehumanizing and insensitive as many thought, and (b) their continued frustration in not being able to focus their discussions on the issues at hand.

Because of the nature of the groups, their reluctance to participate, and the modifications carried out to make Delphi workable in this setting, the description of this effort should have wide interest. In particular, the discussion should be of interest to educators, students of Delphi, and practicing educational administrators.

The Two Case Studies

Before going into the details of the two Delphi experiences, it may be helpful at the outset to indicate the principal differences between the two cases:

1. One case involved a small group of approximately 10 people while the other group involved approximately 50 people.
2. The small group was homogeneous in rank as they were all academic deans; however, since they represented various schools and colleges within the institution, their academic disciplines and their academic sympathies were highly divergent.
3. The large group was extremely heterogeneous in rank and status given that it was composed of students, faculty, department chairmen, deans, and administrators. Of course, the academic background of the group was also highly diverse.
4. The small group was attempting to focus on long-range planning guidelines for the institution over the next 5-10 years, and the large group was looking for specific curricular change in the structure of lower division education at the institution.
5. The Delphi procedure with the small group was administered and analyzed totally by a paper and pencil hand operation, while the large group and their responses through the second iteration were

manipulated by the computer using software developed by Huckfeldt (1972) at the National Center for Higher Education Management Systems. The final phase of the large group exercise, which consisted of summarizing the implications of the Delphi experience, could not be and was not computerized.

The Small Group. The small group, the university's Council of Academic Deans, was comprised of the deans of all of the schools and colleges, the director of libraries, the academic vice president and several of his assistants. The group, over a period of time, had been grappling unsuccessfully with an effort to establish academic goals, directions, and priorities for the institution. After four meetings which were characterized by a minimum of focus in the content of the discussions, it was suggested that something like the Delphi technique might produce some structure from which the discussion could springboard. Specifically, the group as a whole recognized the lack of direction in the discussions, and the question was raised as to whether there was some technique or approach to be taken in helping the group achieve a productive direction. The author selected Delphi and proposed it to the group, meeting with mostly neutral response and some mildly negative reaction based on a perception of the process as a "social science game." The group, however, acquiesced to proceeding with Delphi on the basis of the feeling that almost anything would be better than the aimlessness of the previous meetings.

Given the attitude of the group and the goal which was to be achieved by use of Delphi, i.e., focusing discussion, the author decided to use a two-round Delphi procedure. The sequence of activity was as follows:

1. The respondents were asked to ". . . list, in short sentence form, what you see as important changes which will take place at the institution or what present directions will receive strong support at the institution in the next five years." They were to be submitted to the author in writing prior to the next meeting.
2. After complete return was received, the responses were edited and put into list form. Basically, the editing consisted of the following: (a) wordy responses were collapsed into single paraphrased items, and (b) duplicate items were eliminated. Figure 1 shows the samples of the finished items. The process produced 41 items.
3. At the next meeting, which was two weeks after the initial items were requested, the respondents were given the 41 items in questionnaire form and asked to respond to each in terms of 3 questions: (a) *Assuming this change will occur, what will be its impact?*—using a 5-point response scale with poles representing *none to very great;* (b) *What is the liklihood this change will occur?*—using a 5-point response scale with poles representing *none to very*

Figure 1

ROUND II INSTRUMENT

Change Statement	Assuming this change will occur, what will be its impact?	What is the likelihood this change will occur?	Should the change occur?
	none — very great	impossible — virtually certain	definitely not — definitely
1. There will be continued dominance of teacher certification.	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
2. The percentage of lower division enrollment will decrease, upper division and graduate enrollment will increase, but lower division will remain as a substantial part of the enrollment.	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
3. There will be a growing interest in recreational and cultural offerings.	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
4. There will be a strengthening of our urban role.	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
5. More departments will participate in the three doctoral programs.	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
6. The primary guidelines to the future will be narrowly construed definitions of both urban location and its "service" functions.	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○
7. We will experience a new enrollment surge about 1980.	○ ○ ○ ○ ○	○ ○ ○ ○ ○	○ ○ ○ ○ ○

great; c) *Should the change occur?* —using a 5-point response scale with the poles representing *definitely not and definitely yes.*

4. After a complete return was achieved, the responses were hand tabulated and returned with statistics for each question showing (a) what the individual respondent had answered, (b) the mean (or average) response, and (c) the range of responses. Figure 2 shows what each respondent received. This completed the formal Delphi procedure.

The final product, as shown in Figure 2, was used as a discussion document and served extremely well in that capacity. Initial discussion focused on the range of the items included. Comments ranged from surprise and disagreement as to what had been said in a particular item to discussions of substance related to the implications for the institution's future contained in the items. The author offered little or no guidance as to how the discussion should proceed. Basically, the group found its own direction. The level of discussion eventually got down to the specific response patterns, both in terms of the indication of central tendency shown by the mean and the indication of relative agreement or disagreement shown by the range.

On the whole the results of the exercise were excellent. For the first time the group was able to deal with issues in an organized and productive way. The Delphi experience in the course of its two iterations had not dulled any appetites or enthusiasm for discussion of the subject. In fact, it had clearly provided a focus which was productive for discussion.

The Large Group. This second use of Delphi was motivated for the same basic reason as was its use with the small group—the inability of the discussants to focus their energy and ideas. The large group consisted of a broad range of students, faculty, and administrators meeting to discuss a common concern for the current structure of lower-division education at the institution. It was an ad hoc group which met weekly, in the evenings and on a voluntary basis, to discuss the problem. The size of the group varied from 50 to 70 people across the course of the meetings. After a series of approximately six meetings, the objective of producing a model for a revised lower-division

Figure 2

ROUND III INSTRUMENT

Change Statement	Assuming this change will occur, what will be its impact?	What is the likelihood this change will occur?	Should the change occur?
	none — very great	impossible — virtually certain	definitely not — definitely
1. There will be continued dominance of teacher certification.	o □ Ao o o Range 1-5	o o □ Ao o Range 2-5	o □ Ao o o Range 2-4
2. The percentage of lower division enrollment will decrease, upper division and graduate enrollment will increase, but lower division will remain as a substantial part of the enrollment.	o o o A□ o Range 2-5	o o o □ Ao Range 4-5	o □ o o Ao Range 2-5
3. There will be a growing interest in recreational and cultural offerings.	o o o A□ o Range 1-5	o o □ Ao o Range 2-5	o o o A□ o Range 2-5
4. There will be a strengthening of our urban role.	o o □ o Ao Range 3-5	o o o □ Ao Range 3-5	o o o □ Ao Range 4-5
5. More departments will participate in the three doctoral programs.	o □ o Ao o Range 2-5	o □ Ao o o Range 2-4	o o □ Ao o Range 2-5
6. The primary guidelines to the future will be narrowly construed definitions of both urban location and its "service" functions.	o o o □ o A Range 3-5	o o o A□ o Range 2-4	□ o Ao o o Range 1-5
7. We will experience a new enrollment surge about 19C	o o o □ Ao Range 3-5	o o □ o o A Range 2-4	o o o A□ o Range 3-5

A = Average Response
□ = Your Response

Figure 3

ROUND II INSTRUMENT

I. Indicate the types of students we should be serving (structure the universe into whatever categories make sense to you).

	(RESPONSES)	Do you agree that this response is an important element in the student body of a revised lower division? **Strongly Disagree**	**Strongly Agree**
1.	People who do not come or drop out due to the way in which the educational system functions.	0 0 0 0	0 0 0
2	Gifted people who are now staying away or dropping out.	0 0 0 0	0 0 0
3.	Whoever wishes to come if they can do the work (have the capacity to perform).	0 0 0 0	0 0 0

II. What are the outcomes, benefits, results, needs, etc., which should accrue from a revised lower division structure?

	(RESPONSES)	How highly do you value the output (goal) suggested by this response? **Highly Detrimental**	**Highly Valuable**
1.	Some sense of how organized knowledge and inquiry processes can help the students understand the world, their fellow persons, and themselves.	0 0 0 0	0 0 0
2.	An understanding of the relationship between the presently compartmentalized areas of knowledge and the relating of this understanding to one's everyday experience, perceptions, and ideas (a coherent frame of reference within which to structure the self and the environment).	0 0 0 0	0 0 0
3.	The opportunity to take increasing responsibility for one's own education (more self determination) as a learning experience.	0 0 0 0	0 0 0

III. The "how" or structure necessary to produce the outputs, given the input (From Questions I and II above).

	(RESPONSES)	Assuming this change did occur, what would its impact be? **No Impact**	**A Great Impact**
1.	Greatly decreased class sizes.	0 0 0 0	0 0 0
2.	A variety of class sizes can still prevail as long as groups of students move together through basic courses.	0 0 0 0	0 0 0
3.	The creation of cohort units formed by new students (20-25) around a voiced interest in general areas of educational concern.	0 0 0 0	0 0 0

IV. What do you see as the chief weaknesses of the present lower division structure?

	(RESPONSES)	Do you think the concept in this response merits attention in revising a lower division structure? **Not Important**	**Very Important**
1.	The dominant organization of learning and knowledge about the academic disciplines.	0 0 0 0	0 0 0
2.	Attachment to departments that regard themselves, perhaps properly, as guardians of disciplines said to be divinely sanctioned (improperly).	0 0 0 0	0 0 0
3.	The survey courses are too compartmentalized with too little effort made to connect them to other fields—too much serial, lock-step instruction.	0 0 0 0	0 0 0

structure appeared as distant as it had appeared in the initial meeting. The diverse backgrounds of the participants, the apparent diversity of the opinions as to what changes should occur, and the size of the group all worked as constraints against the ability to emerge with a coherent structure.

Motivated by the fear of losing the enthusiasm of the group if some focus could not be teased out of their gatherings, Delphi was suggested as a means to achieve some sense of structure from which the discussions could produce more concrete results. There was considerable concern in the group about the legitimacy of using the Delphi technique, but the sense of frustration that had built up over past meetings, as with the small group, outweighed the concerns. So planning for the second Delphi experience began.

The initial instrument which was sent to the respondents explained briefly that we were attempting to ". . . zero in on a model with specified components for lower-division reform." Further explanations suggested that ". . . it has become apparent that the open group discussions method has limitations in reaching this goal." The procedure was explained as a series of ". . . requests asking for your response" pointing out that ". , . after each round, summaries will be provided showing a variety of factors about the issues being discussed." The instrument went on to say ". . . after several rounds, there will emerge an indication of group consensus as well as indicators of significant areas of non-agreement;" and ". . . out of this process a model will emerge." The term Delphi was never specifically used in describing the exercise.

The respondents were asked to respond in short concise sentences to the following questions:

1. Indicate the type of student we should be serving.
2. What are the outcomes, benefits, results, needs, etc. which should accrue from a revised lower-division structure?
3. What will be the revised lower-division structure?
4. Given that a suitable model is created, what would be your (short sentence) suggestion for implementation at this institution?
5. What do you see as the chief weaknesses of the present lower-division system?

The instrument or questions were distributed to approximately 70 people, and 51 people responded. At this point a massive editing job took place whereby long sentences were condensed and repetitions were eliminated. Question 4 proved unusable due to a lack of response. The result was a total of 134 short sentence items across the 4 remaining questions. A 7-point scale was constructed for the second iteration to elicit further response on each item. Under each of the four original questions a different response scale question was used. For example, for the items responding to *Question 1* (Indicate the type of students we should be serving) the response scale question was *Do you agree that this response is an important element in the student body of a revised lower division?* with the two poles representing *strongly agree* and *strongly disagree*. For the items prepared for *Question 2* (What are the outcomes, benefits, results, needs, etc., which should occur from a revised lower-division structure?) the response scale question was *How highly do you value the output (goal) suggested by this response?* with the two poles representing *highly detrimental* and *highly valuable*. Figure 3 shows the four original questions, some sample items and the response scale question. The format in Figure 3 is identical to that which was sent to the respondents in the second round.

From the second round, responses were received from 31 people. These responses were keypunched and analyzed by the computer software acquired from the National Center for Higher Education Management Systems (NCHEMS). The software provided for each respondent a summary for each item which included: (a) their individual response, (b) the median as an indication of central tendency, (c) an indication of the range of responses, and (d) an indication of the interquartile range. A sample of the output is shown in Figure 4. In addition, the software produced a variety of summary statistics available to the experimenter which proved very useful for summarizing across all respondents.

Using the summary statistics provided for the experimenter, a general narrative summary of the thrusts shown by the Delphi exercise was constructed and returned to the respondents along with the individual output sheets described earlier. The narrative summary was a highly successful device to frame the ensuing discussion. Specific items along with the response characteristics of the items could therefore be discussed readily in the broader context of what had emerged as important directions for a revised lower-division structure. In effect, the Delphi responses as synthesized by the narrative summary provided an abbreviated prototype lower-division model. The prototype, taken along with the individual output sheets in front of each respondent, were used by the group to work toward the construction of the end-product model of lower-division education at the institution.

Perhaps the most telling occurrence in pointing out the success of this application of the Delphi was a comment made by one of the participants in the meeting when the results and summary were discussed. The individual, a faculty member, rose at the end of the meeting and said, "I wish to congratulate the group on this effort. I have always believed that the use of statistics and the application of social science methods were a waste of effort or a way to hide or manipulate facts. This exercise has changed my mind. This has been a very good experience, and it has helped us deal more directly with this problem of lower-division education."

Summary

The use of the Delphi technique in the two case studies varied in design and methodology from a pure classical Delphi paradigm. Further, the method of the two Delphi applications reviewed here varied one from the other as well. The examples shown here can perhaps help other researchers and practitioners achieve a measure of success in their Delphi applications. Some general observations follow:

1. The Delphi methodology can be and should be tailored to meet the needs of the individuals or groups involved. This implies its modification either through shortening the process or altering its sequence or components.
2. The Delphi technique is a valuable device for focusing on central issues. It does not have to operate as a consensus maker.
3. The greatest value from the Delphi method can be achieved when those administering it are sensitive to the questions or issues under discussion. This factor is important (a) in the editing and synthesis process after round in which respondents give their initial comments and, even more importantly, (b) in the construction of a narrative summary which aids

Figure 4

ROUND III INSTRUMENT

Section I—Input

SD= Strongly Disagree
SA= Strongly Agree

Question 1
This is an important element in the student body of a revised lower division.

	SD						SA
1. People who do not come or drop out due to the way in which the educational system functions. Comment—	•	•	(	•	M Y	)	•
	1	2	3	4	5	6	7
2. Gifted people who are now staying away or dropping out. Comment—				•	(	M Y	)
	1	2	3	4	5	6	7
3. Whoever wishes to come if they can do the work (have the capacity to perform). Comment—	•	•	•	•	(	M Y	)
	1	2	3	4	5	6	7

Section II—Output

HD= Highly Detrimental
HV= Highly Valuable

Question 2
How do you value the output (goal) suggested here

	HD						HV
1. Some sense of how organized knowledge and inquiry processes can help the students understand the world, their fellow persons, and themselves. Comment—			•	•	(	M Y	)
	1	2	3	4	5	6	7
2. An understanding of the relationship between the presently compartmentalized areas of knowledge and the relationship to experience, perceptions, & ideas. Comment—			•	•	(	M	) Y
	1	2	3	4	5	6	7
3. The opportunity to take increasing responsibility for one's own education (more self-determination) as a learning experience. Comment—				•	(	M Y	)
	1	2	3	4	5	6	7

Section III—Thruput

NI= No Impact
GI= Great Impact

Question 3
Assuming this change occurred, what would its impact be?

	NI						GI
1. Greatly decreased class sizes. Comment—	•	•	(	M	)	• Y	
	1	2	3	4	5	6	7
2. A variety of class sizes can still prevail as long as groups of students move together through basic courses. Comment—		•	•	(	M	) Y	•
	1	2	3	4	5	6	7
3. The creation of cohort units formed by new students (20-25) around a voiced interest in general areas of educational concern. Comment—			•	(	M	) Y	•
	1	2	3	4	5	6	7

Section IV—Weakness

NI= Not Important
VI= Very Important

Question 4
Does this concept merit attention in revising a lower division structure?

	NI						VI
1. The dominant organization of learning and knowledge about the academic disciplines. Comment—	•	•	•	(Y	M	•	)
	1	2	3	4	5	6	7
2 Attachment to departments that regard themselves, perhaps sanctioned (improperly). Comment—	•	•	•	•	(	M Y	)
	1	2	3	4	5	6	7
3. The survey courses are too compartmentalized with too little effort made to connect them to other fields—too much serial, lock-step instruction. Comment—			•	(	•	M Y	)
	1	2	3	4	5	6	7

Y = respondent's answer M = Median Dots = Range of Responses Left Parenthesis = First Quartile Right Parenthesis = Third Quartile the group in understanding the results and implication of what they and their fellow respondents have said.

4. Sensitive or concerned audiences will overcome negative reactions to procedures like the Delphi technique if the method is flexibly administered. The greatest fear of the university respondent appears to be a rigid application of a technique resulting in forced, inaccurate, and/or insensitive results.
5. Sensitive and abstract subject matter can be dealt with effectively with techniques like Delphi if flexible methods are employed.

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CONSENSUS BETWEEN INTERNAL AND EXTERNAL CONSTITUENCIES CONCERNING INSTITUTIONAL GOALS

James C. Flint, Wenatchee Valley College

At this time of sagging public support and demands for increased accountability, few activities are more important to American higher education than systematic, perceptive planning and decision-making. Such planning, however, calls for clear statements of educational goals to provide institutions with the necessary focus and direction. Stated goals help tie together assumptions, values, and hopes for the institution into coherent policies that provide standards and guide decisions and actions. Indeed, Eurich (1969) argues that clarifying goals and establishing priorities among them are the first orders of business in managing the future.

In recognition of the need for clearer goal definitions, increasing efforts have been made to identify the goal structures of American colleges and universities (Gross & Grambsch, 1968, 1974; *Danforth News*, 1969; Peterson, 1971, 1972). Institutional goals research to date, however, has focused primarily on groups within colleges and universities (students, faculty, administrators) and has not considered in a rigorous fashion the institutional goal priorities of important constituencies outside the schools. Yet the open systems model for organizational analysis makes clear the need to study goals within the broader framework of the organization's relationship with its supporting environment (Katz & Kahn, 1966). The reappraisal of organizational goals in light of changes in the environment is a particularly important task in this regard (Thompson & McEwen, 1958).

Following the open systems model, the author conducted research while at the University of Washington, Seattle, to examine the degree of consensus between internal and external constituencies concerning that institution's goals. Such a study, it was reasoned, would identify areas of high as well as low goal consensus. This information, in turn, could help provide needed direction for resource allocation and could improve institutional effectiveness by relating educational programs more closely to desired outcomes.

Research Methods

Through a mail survey technique, carefully selected random samples of University of Washington students, faculty, and administrators were sent a questionnaire containing a preselected list of 55 statements describing possible aims or objectives of a large, urban American university. Twenty-five statements referred to institutional output goals or substantive objectives a university might seek to achieve (student intellectual development, individual personal growth, vocational training, research, etc.). The remaining 30 statements described process goals or institutional activities through which output goals might be reached (academic freedom, maintenance of institutional character and quality, increased institutional efficiency and accountability, etc.).

This same questionnaire was sent to representative samples of six external constituent groups having important relationships to the University of Washington: (a) parents of current University undergraduate students, (b) University of Washington alumni leaders, (c) business and professional persons in the Seattle area, (d) state and city government officials, (e) residents of the surrounding local community, and (f) secondary school personnel within the state. The sample totaled 2378 individuals (1166 internal and 1212 external). Students made up more than half the internal sample; the external sample, on the other hand, was more evenly divided, with about 200 persons in each of the 6 constituent groups.

The questionnaire format resembled that used in other institutional goals research. Recipients were asked to indicate on a 5-point Likert scale: (a) how important they judged each goal currently to be at the University of Washington, and (b) how important they felt each goal should be at the school. Thus, both a perceived ("Is") rating and a preferred ("Should Be") rating was obtained for each institutional goal. This permitted an examination of the discrepancy between goal perceptions and goal preferences.

Of the questionnaires sent, 1353 or 56.9% were returned and used in the analysis of data. Response rates varied across constituent groups from a high of 69.7% (University administrators) to a low of 41.2% (business sample). Two other outside samples, parents and government, had response rates below 50%. While these response rates were disappointing, no systematic bias appeared to be operating in the returns that would distort the research findings.

Data were analyzed by constituent group, with group perceived and preferred mean scores, as well as standard deviations computed for each of the 55 institutional goals. Discrepancy scores between perceived and preferred ratings were also obtained. Two-way analysis of variance, combined with the Scheffé multiple comparison technique, was used to identify group goal rating differences that were statistically significant (Scheffé, 1953). Rank order correlations of constituent group goal priorities were also computed.

Research Findings

Broad areas of goal consensus among constituent groups were identified in this study. Faculty and administrators were especially similar in their goal perceptions and preferences, and these two internal constituencies demonstrated the most satisfaction with the University's current goal priorities. Faculty and administrators viewed the University of Washington primarily in terms of its commitment to academic excellence, advanced training, and research. They placed especially high importance on intellectual activity—training students in methods of scholarly inquiry, developing students' ability to synthesize knowledge, and instilling in students a permanent commitment to learning. Also of top priority was the protection of academic freedom on the campus. These findings were consistent with other institutional goals research.

Student respondents in this study were found to share many of the goal preferences of the faculty and staff, although students placed somewhat less importance on intellectual activity and academic standards and wanted more emphasis given vocational preparation and personal development. Again, both findings were consistent with the results of other institutional goals studies.

The six external study groups indicated goal perceptions and preferences not unlike those of the internal groups in many instances. Outside respondents, for example, also perceived the University of Washington as devoted primarily to basic research, advanced professional training, scholarly inquiry, academic specialization, and institutional activities supportive of these output goals. They placed very high importance on the intellectual development of students and the acquisition of skills necessary for productive life-long learning.

External groups also shared with those within the University a desire to improve the institution's environment: to provide for regular evaluation of University programs; to create a campus climate conducive to informal discussions between students and faculty, and one supportive of educational innovation; and to create a system of campus governance responsive to the concerns of all persons. Most striking was the very high "Should Be" rating given by nearly all respondents, both inside and outside the institution, to the encouragement of quality teaching. This goal received the top ranking by virtually every constituent group.

While the study identified many areas of goal consensus, points of contention among groups were also evident.

Student Development

All sample groups perceived little emphasis at the University on the personal development of students. External constituencies, however, placed special importance in this area. In fact, they viewed the responsibilities of the University here to be very broad. A student at the University, they felt, should acquire not only specialized knowledge, but also a general education, a permanent commitment to learning, a set of ethical principles, help in his or her personal and social development, and an appreciation of the culture.

External constituencies also believed that significantly more importance should be placed on vocational preparation at the University of Washington. Parents especially thought students should be given much more help in choosing a vocational career. University faculty and staff, by comparison, were less inclined to assume a great deal of responsibility for the personal development of students. They showed even less enthusiasm for helping students choose and train for specific occupational careers.

Students, as might be expected, also placed a high priority on personal development, including vocational preparation. Students were most evident, however, by their low "Is" ratings for many of the included institutional goals. For 26 of the 55 goals, student perceived mean scores were lower than those of any other constituent group. It is difficult to tell whether these low ratings resulted from normal student cynicism or whether they indeed indicate general dissatisfaction with the University of Washington. It is interesting to speculate whether possible student dissatisfaction with the school might have been increased inadvertently by high school educators. The educator sample in this study, compared to other constituent groups, demonstrated higher, somewhat idealized, perceptions of the current goals of the University. In general, they perceived the school in very positive terms — as a democratically run institution, committed to the intellectual development of students and their training for social responsibility, while allowing them considerable freedom of expression and experimentation. Perhaps compared to the usual high school setting these perceptions are not inordinately inflated. But incoming students may have brought with them elevated expectations, becoming disappointed when these expectations were not met.

Institutional Governance

Significant differences of opinion occurred among constituent groups concerning institutional governance—how the University should be run and by whom. It was here, in fact, that faculty and administrator views differed most noticeably. Faculty, not surprisingly, placed high importance on two related goals — ensuring faculty the freedom to pursue their professional careers as they themselves best see fit, and giving faculty the predominant voice in the determination of important academic issues. Administrators perceived more current emphasis on both goals than did faculty, but in each case felt that the emphasis should be reduced.

Perhaps, however, faculty should give most of their attention to external constituencies. The outside groups in this study made it clear that they feel faculty autonomy and power at the University of Washington is overstressed. The government sample especially was critical of the current degree of faculty influence over academic matters, especially its emphasis on research activities. Eulau and Quinley (1970) found similar dissatisfaction among state officials in their study of government-higher education relationships in nine states. The government sample here was also critical of current efforts by the University to secure a high degree of independence and autonomy. All external groups, in fact, believed that greater attention should be given to increasing accountability at the University.

External Relationships

Disparities in goal perceptions and preferences also occurred among study samples for two related goals—providing educational experiences relevant to the evolving interests of minority groups, and increasing the proportion of minority persons working and studying at the institution. Both efforts had been the focus of much publicity during the past several years. This study revealed only limited support from external groups for these institutional goals. Parents, alumni, and business persons, especially, were very critical of the degree of emphasis currently placed on minority education and affirmative action. The cross-pressure on University officials is clear. The more aggressive they become in providing opportunities for minorities, the more chance of losing support from important external constituencies.

University officials also face conflicting expectations concerning intercollegiate athletics. Constituent groups in this study generally showed great dissatisfaction with the degree of importance intercollegiate athletics currently commands at the institution. Faculty and administrators were especially critical and called for a substantial reduction in emphasis. University leaders recognize, of course, that many off-campus persons identify with the institution primarily through its athletic program. Scaling down intercollegiate athletics, therefore, runs the risk of weakening an important link with the outside community. Alumni and business persons polled in this study, for example, called for only a slight decrease in athletic emphasis.

These same two constituencies revealed a positive identification with the University in several other respects. They placed greater importance than other groups on developing pride in the University, achieving wide-spread consensus concerning its goals and purposes, and increasing the prestige of the institution.

Alumni and business persons, however, were also critical of the University. They saw too much current institutional emphasis on protecting academic freedom and providing for critical evaluation of American values and practices, while not enough attention given to encouraging students' respect for American political and social institutions. All external constituencies, in fact, wanted significantly more emphasis given to encouraging respect for the American way of life, a view not shared by University students, faculty, and staff.

In summary, it should be noted that all constituent groups agreed that many of the institutional goals listed deserved considerably more emphasis. The combined internal samples and combined external samples, in fact, believed that significantly more importance (statistically significant) should be placed on 33 of the 55 included goals.

This disparity between perceptions and preferences would seem to indicate considerable dissatisfaction with goal emphases at the University of Washington. Wide differences between "Is" and "Should Be" ratings, however, were common in goals research at other colleges and universities. In other words, while direct comparisons with other institutions cannot be made, the University of Washington did not appear uniquely negligent in its goal emphases.

One reason for the great differences between many "Is" and "Should Be" ratings, of course, is that this study, like similar studies, focused on "ideals"—the highest level of importance a specific institutional goal should receive. Persons, however, may recognize that there are simply not enough resources to address all the valued institutional goals at their highest level. Or they may see that some goals are contradictory, so that the encouragement of one means that another must be slighted. This research gave respondents the opportunity to rate all institutional goals as highly as they wished. Perhaps it would be more realistic to provide respondents with situations where they were forced to rank goals, one against the other, in order of priority. A truer picture of preferred goal priorities might thus be obtained.

In this study there was also a distinct tendency for external constituent groups, compared with internal groups, to give higher "Is" goal ratings. For 52 of the 55 goals, in fact, the perceived mean scores of the combined external samples were higher than those of the combined internal samples. Many of these differences were slight, but 24 were statistically significant. No predominance of higher mean scores by either combined grouping, on the other hand, was evident in the preferred or "Should Be" ratings.

The low student "Is" ratings previously noted did reduce internal mean score averages, but external constituencies in general saw higher current institutional goal emphasis than did internal groups. Parent, alumni, and business samples, for example, gave noticeably fewer "Is" ratings below the 3.00, or medium importance, level. Were greater University efforts in fact seen? Or were external groups, less familiar with the campus, hesitant to give ratings below the medium importance level? Unfortunately, this research does not answer that question. This study did not find, however, as did Peterson (1972) in his study of the goal structures of California schools, that external groups have a less differentiated view of the goals of the institution. The range of preferred goal values for all constituent groups included here were quite similar.

Critique of Research

How successful was this study in obtaining a reliable measure of goal consensus among University of Washington constituencies? First of all, it suffered the usual pitfalls of survey research—sampling limitations, low response rates, inconsistent responses, and difficulties in data interpretation. The sampling procedures used for the three internal groups were random, and generalizing the research results to the larger constituencies, therefore, is justified. The sample groups for parents and business persons were also selected randomly and thus represent larger groups than themselves. However, four samples—alumni, government, local community, and secondary school educators—were not selected randomly, and the latter three represent a mixture of target populations. Caution, therefore, should be exercised in generalizing the findings for these four constituencies beyond the immediate samples.

In addition, the reliability of a questionnaire such as the one used in this study is always suspect. Of particular concern is the stability of an individual's responses over time. To test this stability, a test-retest procedure was used on a small sample of original respondents. With no previous notice, 31 individuals selected randomly from the original sample groups (both internal and external) were asked 4 months later to complete the research questionnaire again. Of this small sample 27 completed and returned the second questionnaire. Their responses to both questionnaires were then compared to determine their stability.

A Pearson product-moment correlation was computed for the "Is" and "Should Be" sets of responses for each of the 55 goals and then compared against appropriate significance tables (Edwards, 1960). The stability coefficients of only 11 of the 110 sets of responses were not significant to at least the .05 level of probability. Seventy-nine coefficients, or 72% of the total, were significant beyond the .01 level indicating considerable stability of opinion concerning both perceived and preferred institutional goals by this small sample. Thus, some assurance can be had that the opinions expressed in the survey by the various sample groups were not wholly predicated by time and place of response, but rather represent stable attitudes of consequence over time.

One research finding, however, was a point of concern throughout the study. For many institutional goals, variations in ratings within separate constituent samples, as measured by response standard deviations, were quite large. That is, little consensus was evident within individual samples concerning a goal's importance. Variations in responses were wider and more frequent for "Should Be" ratings than for "Is" ratings, and similarly were more frequent for process goals than for output goals. Forty-six percent of the standard deviations in "Should Be" ratings for process goals, in fact, exceeded 1.000, indicating considerable variation in rating responses among individuals. These findings raise important questions about one's ability to ascribe particular goal ratings to specific University constituencies in any meaningful way.

The mixed makeup of several study samples was considered a possible source of response variability. All constituent samples, however, suffered to a certain degree from a lack of internal consensus. Moreover, the parent sample produced the most within-group response variation for both perceived and preferred goal ratings. The standad deviations of 70% of the parents' "Should Be" scores for process goals exceeded 1.000. Public school educators, on the other hand, showed by far the most within-group consensus concerning institutional goal perceptions and preferences; University administrators showed the next highest uniformity of opinion.

Finally, this research was limited by the very nature of the research topic, organizational goals. "Goals," at best, is a very slippery concept. Goals occur at different levels, in various forms, and in differing degrees of specificity. The "means-ends" chain described by Simon (1957), in which goals at one level become means to goals at the next higher level, which in turn become means to still higher level goals, raise important questions concerning the proper level of focus for a study of institutional goals.

Levels of focus and degrees of specificity were important considerations in developing the goal statements used in this study. Efforts were made to phrase goal statements in neither too broad nor too restrictive terms. Levels of specificity did vary, however. Process goals in this study were by their very definition more specific than output goals, and less consensus generally occurred both across and within groups concerning their relative importance. Does an increase in goal precision always lead to a reduction in consensus concerning its importance.

What level goals are most useful in the study of higher education? March and Simon (1958) talk about the "operationality" of a goal—the extent to which there is agreement on the criteria for determining whether particular activities do or do not contribute to that goal. These authors argue that operational goals are needed to encourage groups to act, and that groups will develop operational goals to replace vague or highly abstract goals.

The operationality of a goal is not always easy to determine, however. What is needed now in institutional goals research are concerted efforts to define more higher education goals in operational terms. Then examinations of goal consensus among constituent groups could be related more directly to institutional activities. This study was an attempt in that direction. Its success will be its usefulness in institutional planning and decision-making.

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INFORMATION INPUTS TO DECISIONS ON UNIVERSITY MISSION

Robert C. Shirley, University of Houston

Educators and administrators are now well aware of the drastically changing nature of the numerous external forces affecting higher education. Familiar prognostications include fewer students and fewer faculty; an increased demand for non-traditional forms of education; continuing pressure for development of outcome and accountability measures; further changes in the values of students and the public regarding the appropriate role of higher education; and continued emergence and growth of state-wide coordinating boards which possess decision authority over matters previously reserved for individual institutions.

How may an institution prepare itself in an organized fashion to cope with this uncertain, but assuredly different, future environment? The first step in "coping" is a re-examination of institutional mission. Universities can no longer assume a reactionary mode of planning. Steps must be taken to define more precisely the institution's role and scope, its areas of emphasis, the constituencies to be served, and specific program outcomes and measurement criteria. In short, few institutions can continue being "all things to all people." And this means that we must move beyond the development of ambiguous catalogue statements of goals to the formulation of specific objectives for controlled growth and concentrated effort.

The University of Houston is currently engaged in an intensive, 18-month study of its future mission. From the outset, two major points were agreed upon by members of the Steering Committee: (a) goals, objectives and plans of action were to be established in measurable terms; and (b) where possible, all decisions on goals and other elements of mission were to be information-based, i.e., the various task forces established for the study should justify their recommendations with data about relevant external and internal phenomena. Thus, the study has a strong empirical orientation by design and seeks to avoid opinionated results.

Nonetheless, some misgivings were voiced when it was proposed that final decisions on institutional mission are a function of (a) environmental needs and opportunities, (b) environmental constraints, (c) internal resources and capabilities, and (d) internal values. The misgivings were not about the inherent logic of the paradigm, but rather about the "information-based" standard which was set for the development of recommendations about mission. One can easily identify data needs and data sources with regard to the external phenomena mentioned, and one can, with somewhat more difficulty, develop reasonable methods of assessing internal resources and capabilities. It is considerably more difficult to assess values in any systematic way, but exclusion of such an assessment from the process tends to place undue emphasis on data inputs which are more easily quantified and manipulated. Thus it was decided that internal values with regard to the desired mission of the University had to be systematically surveyed and analyzed to provide a complete set of data inputs for decision-making.

The survey instrument chosen for this purpose was the Institutional Goals Inventory (IGI), a tool developed by the Educational Testing Service to assist colleges and universities in delineating goals and determing priorities for action. This paper summarizes the results of the study and discusses how data on values can be systematically integrated into the process of mission formulation.

Methods of Data Collection and Analysis

The theoretical framework for the IGI consists of 20 "goal areas," 13 related to educational outcomes and 7 related to educational processes. Figure 1 presents a short-hand description of the goal areas.

The core content of the instrument consists of 90 goal statements, 80 of which are related to the 20 goal areas. The remaining ten statements each reflect a goal judged by the Educational testing Service to be sufficiently important to warrant a single item. In addition to evaluating the 90 core items in the IGI, respondents at the University of Houston were given 10 locally-prepared goal statements deemed to be a particular concern to the University at this point in time. Respondents were asked to evaluate each of the 100 statements in two different ways:

- How important *is* the goal at this institution at the present time?
- How important *should* the goal be at this institution?

Respondents indicated their evaluations on a 5-point scale, ranging from "of no importance" (1.0) to "of extremely high importance" (5.0).

The IGI was administered to all full-time faculty, with 51% responding (467 out of 913). The instrument was also administered during regular class hours to a stratified random sample of 1348 students which represented 7.5% of all juniors, seniors, and graduate students. The IGI was also sent to 101 administrators at the director level and above, with 83 (82%) responding. Finally, the instrument was mailed to 300 alumni selected systematically from the graduating classes of 1971 and 1972, with 51 (17%) responding. Thus a total of 1949 usable responses was obtained.

All data were collected in machine-readable form. "Is" and "Should Be" mean values were computed and rank ordered for each of the 20 goal areas, the 10 miscellaneous goal statements, and the 10 locally-prepared goal statements for the total group of respondents. Mean values were also calculated for each subgroup (e.g., faculty, students) and for each college of the University. One-way analysis of variance techniques were then applied to determine if significant differences existed across colleges and subgroups. If differences were apparent, further *post hoc* statistical tests (Scheffé and Tukey) were applied to determine the differences between *specific* subgroups and/or colleges. The results of this analysis are summarized below.

The response rates obtained for faculty, students, and administrators indicate that the results of the study can be generalized to those populations as defined. Moreover, there is strong reason to believe that the results are not merely local in character, i.e., applicable only to the University of Houston. The heterogeneity of the faculty and student body is such that the results should be generally applicable to other large state universities, especially those located in or near urban areas.

Figure 1

BRIEF DESCRIPTION OF IGI GOAL AREAS

Outcome Goals:

1. *Academic Development* (acquisition of knowledge, high intellectual standards, etc.)
2. *Intellectual Orientation* (attitude toward learning, commitment to life-long personal development, etc.)
3. *Individual Personal Development* (enhancement of self-concept, identification of personal goals, etc.)
4. *Humanism/Altruism* (Social and moral concerns related to the welfare of man, world peace, etc.)
5. *Cultural/Aesthetic Awareness* (appreciation of the arts, etc.)
6. *Traditional Religiousness* (dedication to serving God, etc.)
7. *Vocational Preparation* (training for specific careers, re-training opportunities, etc.)
8. *Advanced Training* (providing graduate and professional educational opportunities, etc.)
9. *Research* (conducting basic research, advancing knowledge, etc.)
10. *Meeting Local Needs* (providing continuing education opportunities, trained manpower for local employers, etc.)
11. *Public Service* (helping the disadvantaged, assisting governmental agencies, solving social problems, etc.)
12. *Social Egalitarianism* (providing remedial programs, assistance to minorities, etc.)
13. *Social Criticism/Activism* (critical evaluation of society and its institutions, orientation toward change, etc.)

Process Goals:

14. *Freedom* (ensuring both academic and personal freedoms, etc.)
15. *Democratic Governance* (providing for faculty and student participation in governance, etc.)
16. *Community* (maintaining climate of openness and trust, etc.)
17. *Intellectual/Aesthetic Environment* (providing an intellectually exciting campus, etc.)
18. *Innovation* (developing new approaches to learning, grading, etc.)
19. *Off-Campus Learning* (awarding academic credit for off-campus study, etc.)
20. *Accountability/Efficiency* (using cost criterial to evaluate program alternatives, concern for efficiency, etc.)

Goal Area Results

Figure 2 depicts graphically for each goal area the "Is" and "Should Be" means, rank ordered in terms of the latter. One can visually compare discrepancies between what is and what should be across the various goal areas and draw tentative conclusions as to the relative difficulties involved in moving to the desired state of affairs. Referring first to the "Is" scores depicted on the left, *advanced training* is seen by the 1949 respondents to be the goal most emphasized by the University at this time, with *academic development* and *research* ranked second and third, respectively. None of the top-ranked goal areas are perceived to be of "high importance," however, indicating that the University's priorities are not clear to its constituents. Surprisingly, no significant differences were observed in faculty perceptions across colleges, and only minor differences were observed across subgroups. Thus the "Is" results indicate a fairly uniform view of the University and the importance (albeit fairly low) which it currently attaches to various types of goals.

The "Should Be" results depicted on the far right of Figure 2 show that respondents believe a different ordering of goals should guide the University's programs. *Community* should be the most important goal of the University, with *intellectual orientation* and *vocational preparation* ranked second and third, respectively. The first 14 goal areas listed are deemed to be of "high importance" to the University. Contrary to the uniformity of perceptions observed under the "Is" results, several statistically significant differences were observed in the "Should Be" ratings. Among the more important:

- Undergraduate students believe that greater emphasis should be placed on the *public service* and *innovation* goals than do faculty.
- All students, administrators, and alumni feel that *vocational preparation* should be given much greater emphasis by the University than do faculty.
- Undergraduates and alumni attach significantly greater importance to *individual personal development* as a goal than do faculty.
- The faculty attach significantly less importance to *accountability/efficiency* as a goal than do administrators and undergraduate students.
- Both undergraduate and graduate students believe that more emphasis should be placed on *off-campus learning, social criticism/activism*, and *social egalitarianism* than do faculty.

The discrepancy between the "Is" and "Should Be" results deserve close attention in any attempt to determine the priorities of the University. Looking again at the right side of Figure 2, one can see that, with the exception of *advanced training*, those six goal areas receiving the highest "Should Be" ratings are also ranked in the top six insofar as the gap between the "Is" and "Should Be" scores. This finding helps to simplify, to a certain extent, the task of priority-setting by the University, as those areas which are deemed to be most important are the *same* goal areas where respondents believe the University has failed the most. At the same time, the existence of some instances of significant disagreement about priorities makes trade-offs inevitable.

Figure 2

GOAL AREA "IS" AND "SHOULD BE" MEANS

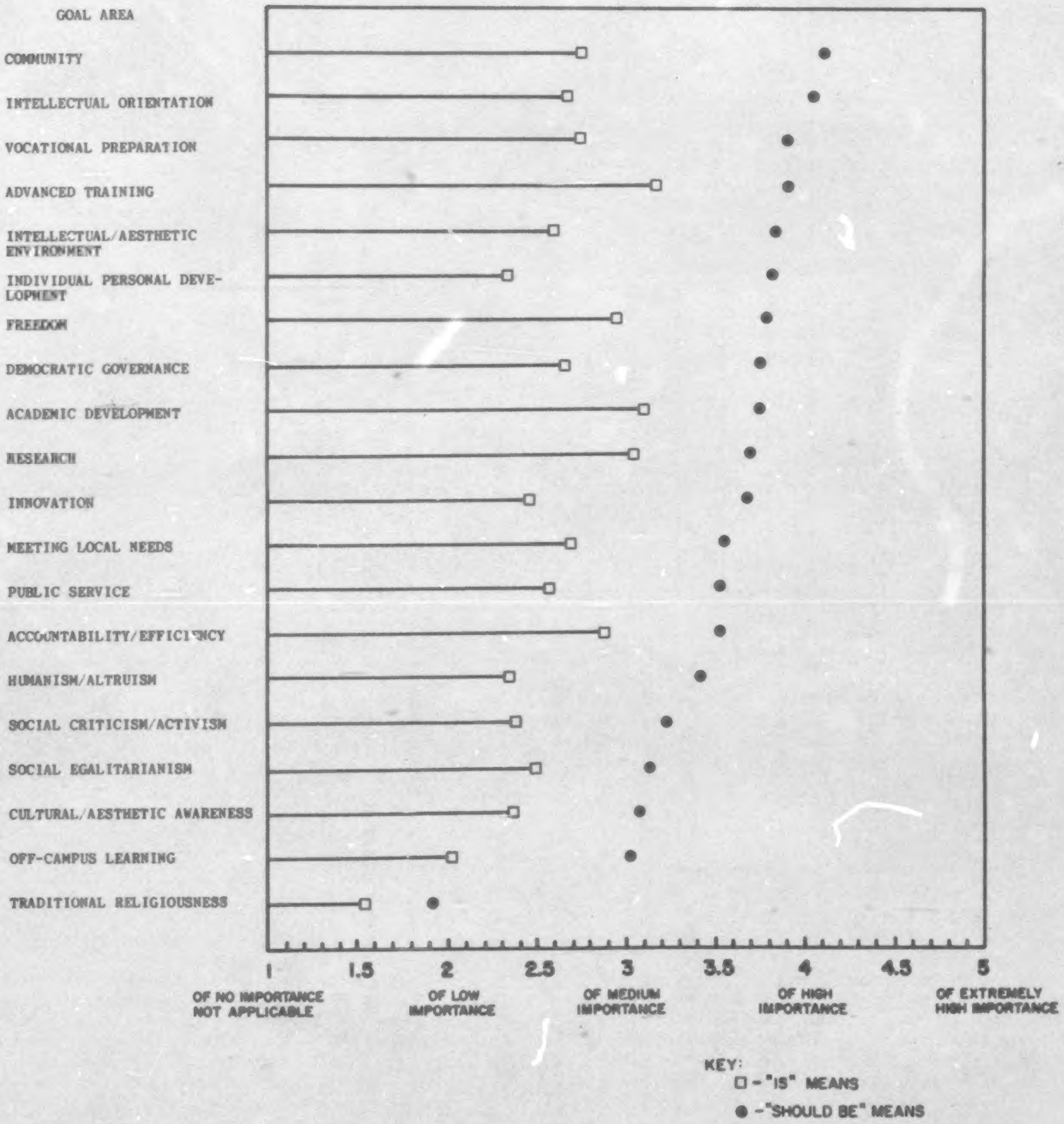


Figure 3

MISCELLANEOUS GOAL STATEMENT "IS" AND "SHOULD BE" MEANS

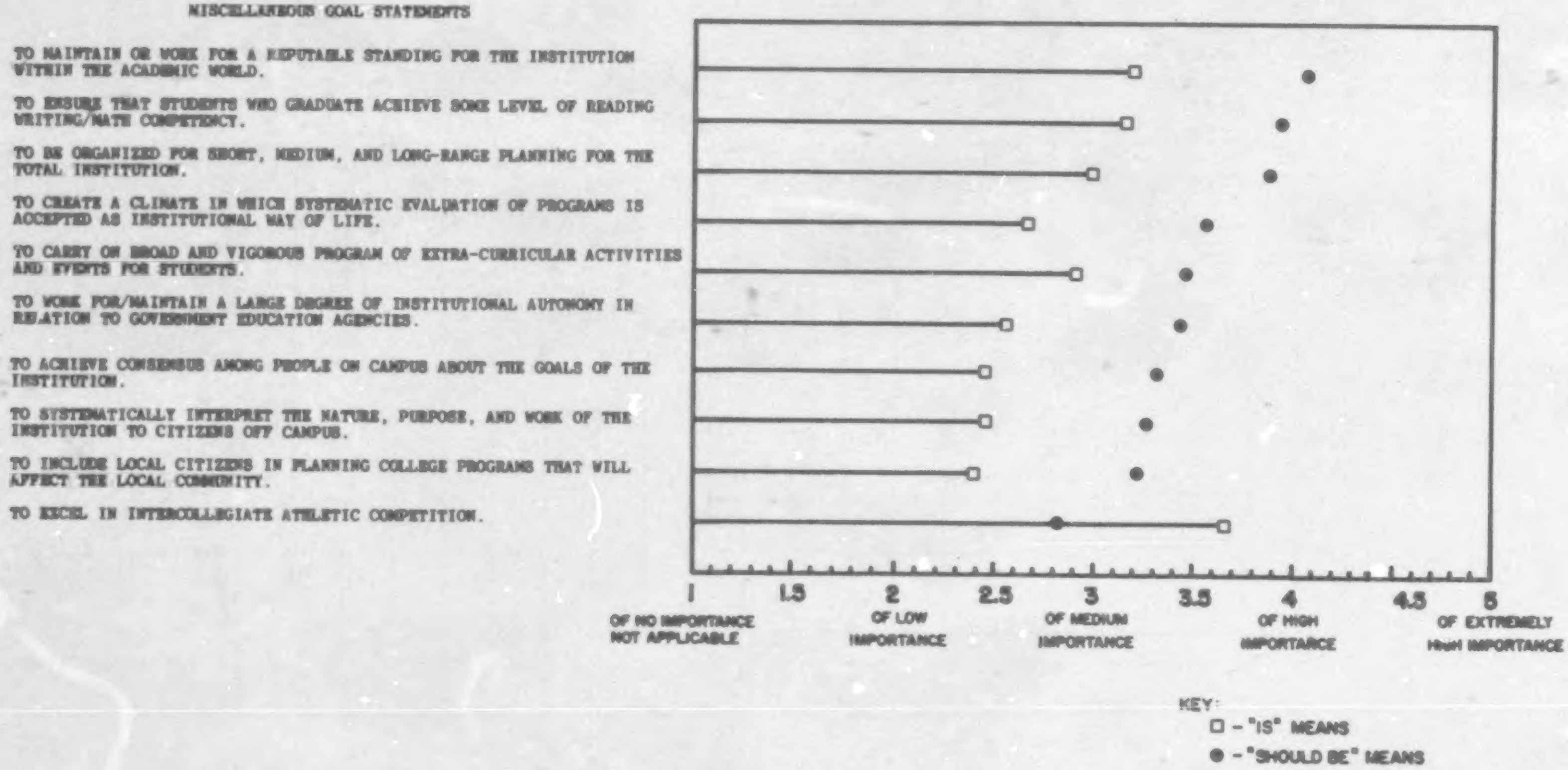
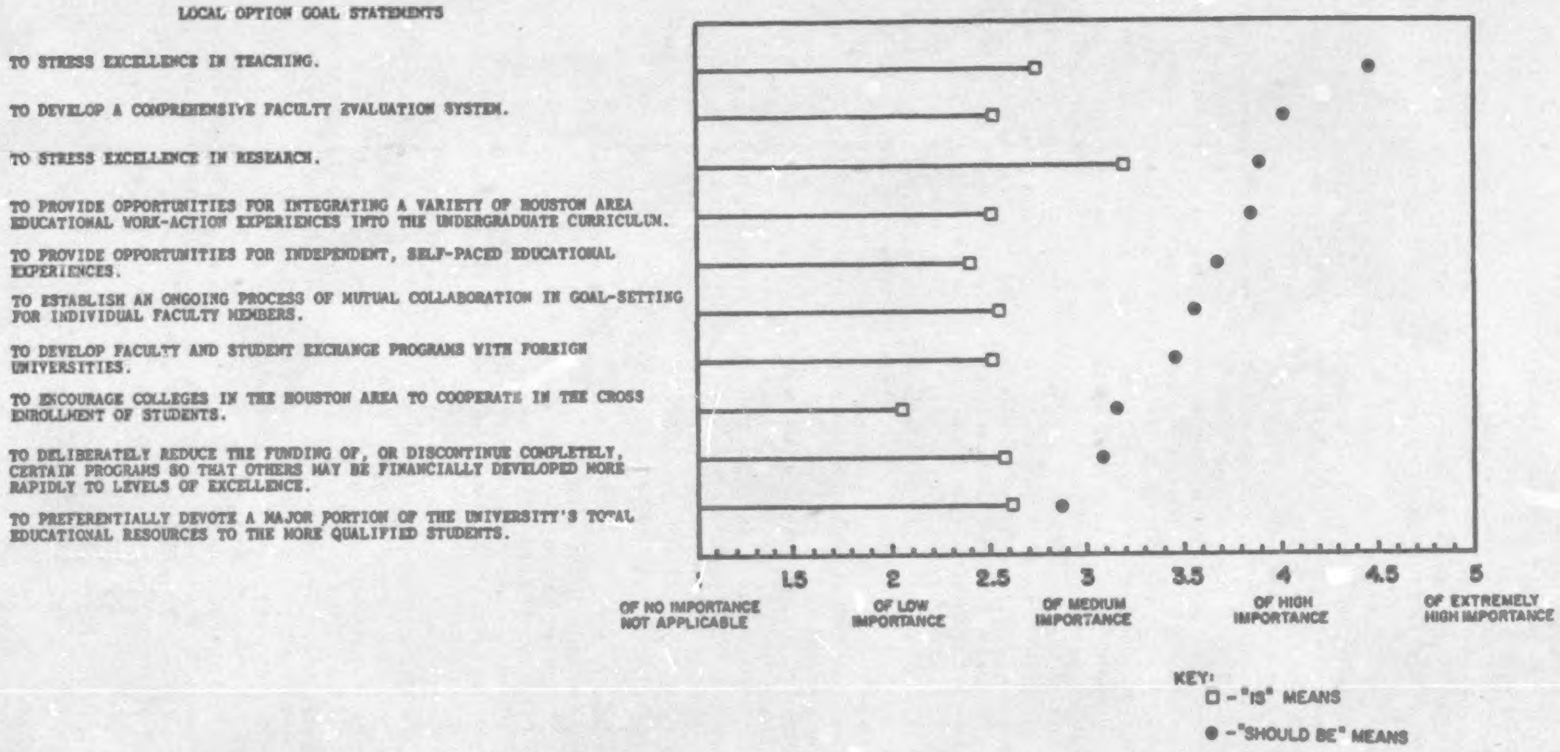


Figure 4

LOCALLY-PREPARED GOAL STATEMENT "IS" AND "SHOULD BE" MEANS



Miscellaneous and Locally-Prepared Goal Statement Results

Figures 3 and 4 present similar analyses for the ten miscellaneous goal statements and the ten locally-prepared goal statements included in the instrument.

As in the goal area results, a high degree of perceptual uniformity was observed across subgroups and colleges with regard to the "Is" evaluation. Several important differences were observed, however, in the "Should Be" scores for subgroups:

- Administrators place significantly more emphasis on the need for *systematic evaluation of programs* than do students and faculty.
- Students, administrators, and alumni all attach significantly higher importance to two particular goals than do faculty: *to develop a comprehensive faculty evaluation system* and *to provide opportunities for integrating . . . work-action experiences into the undergraduate curriculum.* Faculty as a group feel that those goals should be of only "medium importance," while the other groups attach "high importance" to both goals.
- Administrators differ significantly from faculty with regard to the emphasis which should be placed on the goal *to stress excellence in teaching.* Although faculty rate this goal to be of "high importance," the mean value for administrators falls in the "extremely high importance" range.
- Administrators and graduate/professional students attach significantly more importance to the need for *an ongoing process of mutual collaboration in goal-setting for individual faculty members* than do the faculty themselves.
- Administrators differ significantly from all other groups with regard to the importance to be placed on *reducing or discontinuing certain programs so that others may be developed more rapidly to levels of excellence.* Administrators attach "high importance" to this goal; all other groups feel the goal should be of only "medium importance."

Utilization of the Findings

The findings presented in the preceding sections are not exhaustive. They are representative, however, of the kinds of insights which can be gained from conducting such a study. Perhaps the most challenging task associated with research of this type is ensuring that the results are studied and utilized by the appropriate individuals and/or groups. At the University of Houston, a Steering Committee was appointed to design and direct the total mission study. Nine University-wide task forces were appointed and report directly to the Steering Committee. Of the nine task forces, six are "goal-oriented" and three are "resource-oriented." The six "goal-oriented" groups are charged with developing goals and objectives for the following outcome areas: intellectual development of students, career development of students, personal/social development of students, public service and community development, life-long learning, and discovery and application of knowledge. Each of the six groups is operating on the premise that goals are a function of (a) environmental needs and opportunities, (b) environmental constraints, (c) internal resources and capabilities, and (d) internal values. The Office of Academic Planning supplies data of an environmental nature; the three "resource-oriented" task forces supply data on internal resources and capabilities; and the results of the IGA described briefly in this paper constitute the major source of data on internal values. The IGI results have been supplied, of course, in much greater detail than was possible in this paper—even to the extent of item-by-item results and calculations of statistical significance tests. Each of the six "goal-oriented" task forces is, thus, able to determine not only the beliefs and values of the University's constituencies and points of potential conflict, but also determine if those values are consistent with other external and internal phenomena of more tangible character. At the same time, the Steering Committee for the study is using the IGI data as a barometer of institutional values and as a means of comparing its *own* values with those of the larger University community. This approach leads to greater awareness of one's own values and biases, thus creating better decisions as well as more open communication and constructive conflict.

The results of the IGI should be extremely useful to an institution in setting priorities for action and determining areas of emphasis, key ingredients of any statement of mission. When utilizing the results in this manner, four points are important. First, the "Should Be" score of a particular goal area or item indicates, in an *absolute* sense, the amount of importance which should be attached to the goal. Thus, all goal areas and/or items with "Should Be" scores in the "high importance" or "extremely high importance" ranges deserve close attention in decisions on priorities. Second, the fact that most universities are constrained by limited resources necessitates a ranking of goals to determine the *relative* importance of each as perceived by the university community. Third, one must evaluate the discrepancy between the "Is" and "Should Be" scores accorded a particular goal. As was indicated earlier, the study results at the University of Houston revealed a high correlation between the "Should Be" scores and the discrepancy values. Thus the task of priority-setting is simplified, to a great extent, when those goals judged to be most important are also those where the institution is perceived to have failed the most. Finally, one must realize that decisions on priorities must take into account external and internal phenomena other than values alone (e.g., guidelines of a state-wide coordinating Board, strengths and weaknesses of faculty). Thus, while extremely important, internal values must be viewed as only one part of the total information set necessary to support decisions on mission.

Summary

This paper has briefly described the results of a study of institutional values and how they may be utilized in a larger study of university mission. The findings revealed a high degree of perceptual uniformity concerning the present goals and priorities of the University, but significantly less convergence of values with regard to what *should be* the goals. Specific instances of disagreement were cited to illustrate how such a study can reveal points of divergence on major issues facing *all* universities. Finally, the paper pointed out the manner in which the results are being utilized at one institution, the observed benefits, and some guidelines for utilization of the results in priority-setting.

THE INSTITUTIONALIZATION OF INFORMATION SYSTEMS: OR, WHAT WE NEED TO LEARN BEYOND NCHEMS

Dwight C. Smith, Jr., State University of New York at Albany

There is a certain glibness about the way institutional researchers, computer specialists and like-minded brethran refer to "information systems." They have become our life blood; and we are, by and large, so convinced of their necessity for institutional survival that we spend our time discussing ways of making them better, on the assumption that the term is somehow consistently self-defining and will without question serve us with pertinent, reliable, and useful end products.

It works if we move in environments that are receptive to our underlying assumptions about managerial processes and decision-making, and if we have the time and resources both to have thought through our operating problems and to have designed responses to them. But most of us, I suspect, do not have these advantages. Our environments—and I include in them not just the confines of the campus but the external arenas in which campus intentions must be thrashed out in order to achieve the blessings of whoever "out there" holds the ultimate power of endorsement over our plans—are not always receptive to a well-ordered (as we would define it) managerial process. Additionally, we are seldom staffed to develop information systems that are geared to peculiar administrative structures. We either muddle through or rely on someone else to do the work that we can then import or copy; and we trust that our results will somehow address the needs of our environment.

In these circumstances our basic orientations have been toward the development of processes. My purpose here is to suggest that we have been led to understate the scope of "information systems," particularly as they relate to the analytic functions of institutional research. What we have imported or copied from the technical experts as information systems is likely to be a finely-tuned middle segment for analyzing campus activities. It has come to us with no beginning and no end and is, thus, disconnected from our real world. I wish to address this connectional problem from the experience of one campus that has attempted (and with modest success) over the past five years to institutionalize the analytic products of the National Center for Higher Education Management Systems (NCHEMS) within an ongoing process of information production and exchange. By describing our efforts to construct the appropriate connectors in our world, I hope to illustrate some of the pitfalls facing both production and use of NCHEMS reports, and to suggest finely-tuned though it may be, that the analytic process needs to be reconsidered.

The background for our experience in information systems has been the development by Central Staff of SUNY of reporting procedures for various classes of data. Two principal reporting mechanisms have been involved: the "traditional" questionnaires focused on demographic data about students and faculty; and more recent formats by which we describe course enrollments and class schedules for the purpose of analyzing departmental and faculty workloads and instructional costs. The two mechanisms have been developed by separate, parallel offices in SUNY, but because both offices obtain their data from the same source on virtually every campus—the Office of Institutional Research—the results are generally consistent and compatible within each campus.

Our demographic reporting requirements need little explanation to institutional researchers. They are structured to meet historic data needs of both federal and state offices of education. The reporting requirements of the two agencies vary in small but sometimes significant respects; those differences are met by a complex though reasonably straightforward system of reports from the campus that permit the Central Staff to realign aggregations of information to meet varying information requests. But "traditional" does not always mean "routine." Our campus has more than doubled in size in the last decade, and our mechanisms for obtaining, storing, and handling demographic data did not grow as rapidly. For several years we were hard pressed to provide reliable and timely data. We learned to accept varying levels of ambiguity, and to live with the notion that "feeling comfortable" with an estimate that had to be constructed from minimal real data was a more useful stance than anxiety over the absence of precision. We are now well into the process of catching up with the world, though we can note that the struggle is never-ending. As our computer resources have become more sophisticated, we have changed our systems for maintaining both student and employee records. Those changes have been accompanied by promises of a bright—if not brave—new world ahead; but our sense of "progress" toward it has occasionally faltered as the developmental process periodically consists of two steps forward followed (in random sequence) by one to three steps back.

Workload reporting requirements have had a shorter history in SUNY. Beginning in 1966 Central Staff began collecting course enrollment and faculty teaching assignment data from the campuses. The reporting structure was a California import, and thus it shared genealogical roots with the programs later developed and circulated by NCHEMS. The kindest assessment of the original system would be that it showed promise, but that it could not deliver. Campus data systems at that time were too diverse; budget allocations and teaching assignments could not always be matched; the time lag between submitting data from the campus and receiving analytic reports in return generally exceeded 15 months. As a result, no one on campus ever paid much attention to the workload analysis project, though there was considerable anxiety generated over the ways in which it might be used. Inability to deliver may have been a silent blessing, since the analytic software was not (and, as it turned out later, could not be) documented. Fortunately, that analytic system fell into the hands of staff able to address its weaknesses, and its successor report, the Course and Section Analysis (CASA) can now be obtained on campus in a reasonable time period and with a degree of reliability that is limited by the data and not by the software.[1]

We began looking at the analytic software of NCHEMS at the time when our confidence in SUNY analytic procedures was at its lowest point. Our first glimpse occurred in the Spring of 1971 when the Cost Estimation Model (CEM) was "brought up" on our UNIVAC 1108. The effort was directed then at a Central Office-sponsored demonstration project that would use data from one of the four-year campuses of SUNY. That project never did pan out, but our campus inherited the CEM software. During 1971-72 we experimented with it to the point of producing Induced Course Load and Induced Work Load matrices and a direct instructional cost report from our Fall 1971 enrollment data. Our endeavors were for testing purposes only. We learned that the programs were operable on our data. We also learned that the IWLM matrices were too small for the number of disciplines and majors at Albany (a handicap we overcame by aggregating some related majors and disciplines so as to fit the matrices). And we learned that fiscal data required for the model was not easily obtained at the campus level in New York State.

In 1972 the 1.6 version of the Resource Requirements Prediction Model became available, and we added its programs to our library. As a result, we were able the following Spring to run a new IWLM analysis and direct instructional cost reports for each discipline and major. This time the matrices were big enough; but it became evident that displaying one semester of enrollments against a full year of costs (however they might be obtained) was misleading, particularly when we were aware of enrollment swings of up to 20% from Fall to Spring in certain academic units. Consequently, we laid plans for developing a year-long data base the following year against which direct instructional cost analyses might be run.

As we were about to plunge into the edit process for the 1974 Spring semester, our plans were superseded by a new Central Staff-sponsored project aimed at bringing the Information Exchange Procedures (IEP) package of NCHEMS to SUNY. The result was another year of testing, though this time it was a cooperative effort among the five doctoral degree-granting institutions in SUNY[2] directed at a more widespread and, in the long run, potentially more compatible series of analytic activities. During 1974 the project's objective was to test IEP programs against available 1973-74 data with the expectation that during the Summer of 1975 we would repeat the process "for real" with this year's data—that is, to produce numbers that could be used to report publicly the status of each campus from a cost accounting point of view.

Because we had already initiated plans relating to 1973-74 data, the Albany campus entered the project on the basis of utilizing CASA rather than the cost analysis software of IEP. We did so for four reasons. First, it was available and we were familiar with it; and since it represented nearly a decade of developmental investment by SUNY, we felt it would be a mistake to abandon it before its potential had been tested more fully. Second, CASA already had operational roots in SUNY and did not need testing per se. Its direct cost outputs are accepted and utilized by the State Division of the Budget, and glimmerings of campus interest in its products could be seen. Third, we were already obligated to produce data for CASA, and we were not convinced that the development of overhead and support calculations at the program level—the primary output obtainable from the NCHEMS software and not from CASA—was sufficiently important to warrant a second analysis of the original data. Fourth, we assumed that during a testing period the campuses jointly might learn something more from a comparison of different analytic procedures than what might be learned by conforming to identical routines.

We have not yet taken the time to make that comparison, and I suspect that given the budget crisis now facing us we may not be given a chance for such an intellectual indulgence. Nevertheless, our experience has illuminated several characteristics of the analytic process that deserve more attention from institutional researchers before we surrender completely to external analytic regimens.

Meanwhile, we have evolved a series of reports for internal consumption that utilize the results of our information systems. Demographic data is consolidated into a "campus profile" that we prepare about two-thirds of the way through each semester. The Fall profile is the larger one reflecting the fact that we are required to report externally in greater detail at the beginning of the academic year. We began our profile series in the Spring of 1971 when we sensed that our abilities to obtain and store data and to produce statistical summaries had begun to catch up with the campus growth of the previous five years. The profile is primarily a reflection of reports to Central Staff; it also bears a rough resemblance (obviously: they deal with the same data elements) to the non-fiscal portions of the Information Exchange Procedures package that NCHEMS has been working on. In each case, however, data is reformatted for relevance to internal problems. The report of majors by class year, for example, is structured around our academic organization, rather than a numeric sequence of HEGIS codes; the report on geographic origins of students is structured around New York State geography and the State's designation of "regions," rather than an alphabetical listing of counties. The profile has wide distribution on campus and is probably the major reason for a significant drop in the number of calls for discrete pieces of information that used to provide one of our major distractions.

Our internal experience with analytic data has a longer and more evolutionary history, beginning with a "Departmental Workload Analysis" (DWA) that pulled together for each academic unit its Fall teaching loads and course enrollments, the "bottom line" in each case being a faculty-student ratio. This report series began in 1968 in response to the Central Staff project for reporting course enrollment and teaching assignment data that was mentioned earlier. That project had begun with data concerning the Fall of 1966; after receiving the analytic results of that project in the Spring of 1968 and reflecting on what might happen to the balance of power in SUNY if offices elsewhere knew more about us than we did, we concluded that a parallel internal report was necessary. The least we could do for our deans, we reasoned, was to alert them to the data being sent elsewhere and to the consequent perceptions of campus activity that might result.

It should be emphasized that the Departmental Workload Analysis contained no cost data. We did not report it to Central Staff; and our own personnel records were largely manual and incapable of providing internal cost information with any degree of reliability.[3] Nevertheless, our internal reporting structure continued with minor adjustments through the Fall of 1973. It has now been superseded by a "Program Indices" report that incorporates a number of suggestions (and complaints) from deans and department chairmen. New data items include a tenure-oriented rather than rank-oriented description of faculty; a summary of degrees awarded as one indicator of unit outcomes; an analysis of attrition (between the enrollment reporting date and the end of the semester) as another outcomes indicator; and direct instructional costs. Most importantly, however, in response to a major objection from our workload audience, the revised report provides a five-year summary of unit activities. The result is an emphasis on longitudinal development rather than cross-sectional comparisons. That shift in emphasis was intended to reduce a level of interunit tension that had been an unintentional by-product of the old Departmental Workload Analysis. Cross-campus comparisons are unfair said deans and chairmen. They ignore differing rates of development in individual disciplines, differences that are inherent and inevitable (indeed, many of them are deliberate) in a university center regardless of its age. They imply that program status depends on what has happened in other disciplines rather than what each academic unit has done with the resources available to it over a period of time. And the structure of a cross-campus analysis that is not sensitive to such qualifications suggests that its potential uses are negative and punitive.

The Program Indices for 1974-75 were distributed earlier this month. It is too early to tell whether our new reporting format will serve the campus community better than the old one did. The use of information systems is as much a function of the environment as it is a byproduct of the systems themselves. If the old Departmental Workload Analysis was limited in its function, the cause may lie in the times; we had more external support for growth then, and were not as pressed to assess productivity and resource management. As that condition has changed, we hope the Program Indices will become working documents. We can note at least one unanticipated but certainly appropriate use, however; the Indices have been a significant source of information for a faculty-comprised Select Committee on Academic Program Priorities that was appointed this past winter to review Albany's doctoral programs.

Three observations are implicit in this summary of Albany's experience. First, the primary focus of information systems designed off campus has been on providing data to outside users. Second, reporting formats have been designed by outsiders with their own questions as the primary focus. Third, demand for our products has been increasing steadily, but our resources tend to be limited both for the generation of our own systems and for responses to data requests from multiple sources.

I suspect that the Albany experience is not unique and that other institutional researchers (particularly those on the campuses of multi-unit public systems) could describe similar histories. To the extent that my preliminary observations may thus reflect a wider base of experience than one campus, we are faced with a pair of dilemmas centering on the problem of priorities, but extending from them into some fundamental questions concerning information systems and decision structures. The campus IR person must decide the extent to which he is a functioning member of his campus community responsive to its information needs, as distinct from being little more than a conduit *in situ* for the information needs of external bodies. At the same time, external systems designers and operations overseers—those who give us the tools and those who want them to be used—must determine how best to respond to questions posed for state or national audiences while relating their requirements for information to the operating context of the campus.

The private, self-contained college is in a position to minimize these dilemmas, but for the rest of us the search for viable compromises is tough. We have solved the internal dilemma by assuming that our primary mission is to meet campus needs. To fulfill that mission our objective is a series of internal systems that will produce the numbers we need (both for demographic and analytic requirements) as automatic by-products of ongoing administrative activities. With those systems we would concentrate on defining and answering questions relevant to campus authority and responsibility. If we achieved those goals I would conclude from a campus perspective that we had "institutionalized" our information systems. If in that process we also generated the data that external bodies would like, so much the better; but their needs must take second place to our own.

To be sure, this is an extreme statement of a position that we could not maintain in practice. There will be compromises as we produce data for external purposes that will obviously strengthen the campus position. But how far can we compromise while maintaining the integrity of a campus administration. Can external agencies demand more and more of us, using implicit threats over our heads for noncompliance to a point where we are unable to support the campus that hired us? Our effectiveness could easily become a function of the sensitivity of external agencies to information needs other than their own.

It is within this hypothetical context that we can return to what I consider as my opening question: to what extent will NCHEMS products assist us in institutionalizing an information system? To the extent that it falls short of the goal, what more do we need to know?

I began by asserting that NCHEMS products have had only partial success in addressing our systems goals. Such criticism is cheap; what are my alternatives. It would be presumptuous of me to answer that question directly, even if I had a good answer. Instead, I would like to suggest in brief fashion what appear to me to be six stumbling blocks to the institutionalization of NCHEMS systems; and to propose an approach by which NCHEMS and campus-based IR persons might collectively work to remove them.

1. An elegant set of programs may look impressive, but they are not worth much if the campus cannot obtain the data to run them. Data element dictionaries may clarify data needs, but they cannot guarantee that the data will appear. Who really teaches a particular guided reading course? How capably and reliably do multiple admissions offices on campus provide permanent student data: how does that data flow relate to the Registrar's records of course enrollments or to the Bursar's records of tuition payments? Some of the data flow questions are so mundane that we may find it hard to believe that they represent problems; but meshing them on a complex campus is no mean feat. A campus may have great talent for analysis, but unless enough attention is paid to all the details inherent in the data, it may be incapable of producing consistent reports.

2. From the campus viewpoint, one of the least credible goals of NCHEMS may be its search for comparability. The pitfalls of comparability have been described at length at prior institutional research meetings, but the message apparently has not penetrated. I will be grateful for data from another campus that makes mine look good; but on the whole, I am more interested in what has happened over a specified time span to my own campus, or college, or department than I am in how I appear in some respects (usually dollar-related) when compared with another institution or program whose academic strategies may be unknown. Questions of comparability may have a

superficial appeal off campus, as a substitute for knowning what is really happening at each unit being compared, but for the campus IR person the best possible outcome of data comparison woud be for it not to occur at all—at least not until a system has first been proposed that strengthens the campus' ability to understand and manage itself in its own terms.

3. A potential advantage perceived in centralized development (as in NCHEMS) of systems is that it might avoid some costs of individual, tailor-made systems. The solution has been a comprehensive, global one, capable of answering virtually every question. But not every campus needs the global solution. Its needs for information might be specified arbitrarily as being "worth" 10% of all the questions that might be asked; should it be required to run all 100% in order to achieve 10%? It might be that a more effective approach would be the development of a series of smaller problems for which "hand-held models" would provide sufficient data.

4. The concept of global solutions has often been combined with the ability to work with large masses of data into a system concept that assumes external questions should be allowed to work with the same data base as the campus. The inevitable result is encouragement of second guessing and a consequent erosion of campus authority. Should the outsider be allowed to review all our unit data, and thus have the opportunity to ask any question just because he has the computer capacity to do so? Or are there some levels of data (and questions) to which the outsider should not have access.

5. Closely related to the problems of comparability and a limited scope for questions is the matter of decision structures. Not all campuses are alike. And the reasons for difference may lie well beyond higher education. The self-contained, independent school has a markedly different concept of campus decision-making than the unit that is part of a public system. Even within the subset of public institutions there are variances in fiscal autonomy that bear directly on what the campus can decide and, consequently, what information it can use. The SUNY campus, for example, operating with a modified line-item budget and under strong pre-audit and post-audit controls from the State Controller's office, has an entirely different sense of its authority and its scope of ultimate judgment than, say, a Big Ten institution. Our deans have little or no incentive for looking at cost data beyond the dollars directly associated with their own instrucional departments and, for them, "full cost" is irrelevant.

6. The recent history of higher education—from which current concepts of cost analysis have been drawn—has been characterized by steadily increasing enrollments and a focus on data that would support increased budgets. It is evident that in the middle-range future, universities generally can expect reduced enrollments to be the rule. The NCHEMS program cost system is not bounded by considerations of growth; decreased enrollments can be projected and simulated just as easily as increased enrollments. But before we assume that the same analytic structure *should* be applied simply because it *can* be applied, some attention needs to be given to the nature of institutional management in times of decreased demand.

My exposition of a "campus viewpoint" may bring nothing but frustration to the outside observer who has had enough experience already with obvious questions and elusive answers. I would argue, however, that though it may sound frustrating it provides the only practical approach for all of us. The outsider may be able to capture a lot of numbers, but he is not going to get much useful data until the internal needs of the campus have been satisfied. The solution to institutionalization, then, lies in a restructuring of system products away from external needs as the primary consideration and toward the internal problems of the campus.

But are we back to the inefficiencies of tailor-made solutions? Not necessarily. The alternative lies in an appropriate sequence of questions. We have been asked to begin by assembling data on the assumption that the availability of some potential answers will encourage the development somewhere of the "right" questions. Instead, we need to develop a procedure by which the campus could assess the nature of its internal decision problems first, and then be given some advice on priorities within an information system concept that will address its needs. The results might not be as neat and pretty as a skillful programmer is entitled to expect, but they are likely to be more effective.

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[1] The analysis of Fall 1966 enrollments and workload did not reach the campus until the Spring of 1968, and even then it contained no cost data. In contrast, we were able last week to distribute a report to our deans that projected this year's direct instructional costs, based on the Fall CASA reports that we received in late February and a preliminary campus analysis of Spring enrollments.

[2] The four university centers at Albany, Binghamton, Buffalo and Stony Brook; and the School of Forestry at Syracuse. Simultaneously, cooperative projects built around IEP were undertaken by a group of four-year colleges in SUNY and by the State's community colleges.

[3] We later learned that Central Staff was privately matching our report with their salary rosters in an effort to generate costs secretly. Errors abounded; once we surmounted the paranoia implicit in the original procedure we were able collectively to develop revised procedures that now produce more reliable instructional costs.

STRATEGIES FOR ACCEPTANCE AND UTILIZATION OF SIMULATION MODELING AS A MECHANISM FOR FACILITATING STAFFING REDUCTIONS: A CASE STUDY

Jim Nichols, Concord College and
Bluefield State College

"The Great Table," a poem by Laughlin (1974), ought to be required reading for every institutional researcher. It tells the story of the young institutional researcher who builds "The Great Table" only to have his president ask, "Where is your head?" and demand something that could be "understood." Laughlin summarizes the moral of his epic as, "Be sure to communicate with those who need the data to whom you are going to feed." The farther institutional research progresses, the greater the moral of Laughlin's poem becomes an imperative consideration.

The ability to virtually inundate those who need with reams of what should be meaningful management information exists on many campuses today. The closing of the gap between institutional research *ability to produce* management information and the willingness on the part of academic and other administrators *to use* such information in decision-making is the primary issue facing institutional research today. The following paper is a case study of the strategies used to narrow the gap on one campus by stimulating the use of simulation modeling.

In November 1974 it became apparent that Concord College would be required to reduce its staff by approximately 17% over the next 2 years in order to insure even minimal faculty salary increases in 1975-76 and 1976-77. The College had recently undergone administrative realignment based upon the Likert Linking Pin theory[1] and the management team concept.[2] The President determined that the staffing decisions would result from a task force composed of himself, the Vice President for Academic Affairs, and the six Division Chairmen supported in a staff role by the Coordinator of Institutional Studies.

The Office of Institutional Studies had existed on the campus for three years and produced each semester a series of automated reports relating to enrollment, student credit hour production, and so on.[3] The data had been widely distributed, but little used by anyone other than the central administration.

As the gravity of the staffing situation became apparent in November 1974, the President asked for a proposed plan or sequence of steps for reaching the necessary decisions which would (a) encourage active participation by the Division Chairmen and (b) bring to bear on the problem the best management information available. The plan proposed incorporated, as a key ingredient, the use of simulation modeling utilizing the National Center for Higher Education Management System (NCHEMS) Resource Requirement Prediction Model (RRPM) 1.6.

Along with the proposed plan, the Coordinator of Institutional Studies forwarded a copy of *A Blueprint for RRPM 1.6 Application* (Huff & Young, 1973) and reported on a simulation exercise which had taken place at Concord College the previous year. In that exercise the Division Chairmen were asked in the Fall 1973 to project course enrollment and student credit hour production for the Fall Semester 1974. Paralleling their effort, the Office of Institutional Studies conducted an iteration of RRPM 1.6. The results and comparison of the two approaches to projecting Fall 1974 student credit hour production by division are shown in Table 1.

After some consideration the President accepted the proposed use of simulation modeling. When questioned afterwards concerning why he had chosen to accept the proposed use of the relatively sophisticated and unfamiliar management tool, he replied that he wanted to reach the decisions as objectively as possible and wished to take advantage of the simulation modeling capability which had been demonstrated. In addition to these reasons, it must be indicated that a basic predisposition toward acceptance of a "management" philosophy existed within the President.

Simplification and aggregation to the highest meaningful level were the guiding principles in selecting the data to be provided to the participants. Because *positions* were the ultimate decisions, neither faculty salary nor faculty rank were included in the model. Support personnel, academic administrators, supplies and so on were also deleted so that the focus of the model was on *teaching faculty positions*. Originally, four course levels were compressed into upper and lower division courses. However, initial use of the model with the participants indicated that the use of the model should be shifted to one course level.

Several aspects of the situation at Concord College precluded use of the RRPM 1.6 data displays. While RRPM 1.6 produces an excellent summary by organizational unit (discipline), it does not provide a single page report showing the effect across each organizational unit of changes in different variables. Additionally, RRPM 1.6 multiplies a calculated or input number of Full Time Equivalent (FTE) faculty positions by a given average faculty salary to provide a total instructional budget. At Concord College the approximate total instructional budget for 1975-1976 was known; however, needed was the effect on average faculty salary of various staffing alternatives. For these reasons and to overcome some apparent reluctance to work with "printouts," the format displayed in Table 2 was used by the participants.

The components of the data format which the participants used in their discussions are as shown in Table 2 and explained below:

1. *Projected Student Credit Hours, Fall Semester 1975:* Using RRPM 1.6 various mixes of student program enrollment were driven through the Fall Semester 1974, Concord College, Induced Course Load Matrix to result in projected student credit

hours by organizational unit in the Fall Semester 1975.

2. *Organizational Unit:* The familiar pattern of institutional organization by discipline/department and division.
3. *Productivity:* The number of student credit hours produced per full-time equivalent faculty position.
4. *FTE Faculty:* The number of full-time equivalent (FTE) faculty either input or derived from a given iteration of the model.[4]
5. *Difference from Fall 1974:* The difference between the "FTE Faculty" under consideration in the iteration and the number of FTE faculty teaching in the organizational unit in the Fall Semester 1974.
6. *Staffing Constraints:* Remained constant through all iterations and resulted from guidelines adopted as policy by the West Virginia Board of Regents. FTE distribution of the faculty was based upon the organizational units in which the faculty taught in the Fall 1974.
   a. *Termination as of May 1975:* The number of FTE faculty members in an organizational unit who through notification by December 15, 1974; March 1, 1975; or through some stipulation (one year contract, terminal contract, and so on) in their current contract could be terminated as of May 1975.
   b. *Termination as of May 1976:* The number of untenured FTE faculty members in an organizational unit who had been employed for longer than two years and required a full year notice.
   c. *Tenured:* The number of FTE faculty teaching in an organizational unit who held tenure. It was determined early in the discussions that those faculty members holding tenure would not be terminated.
7. *Resulting Average Salary in Instruction:* Derived by dividing the College Total FTE Faculty resulting from an iteration of the model into the approximate amount of funding to be available for salaries in 1975-76. Percentage in parenthesis relates this average salary to the same figure in the Fall Semester 1974.

With the institutional situation and components of the model established, a consideration of the strategies utilized to facilitate *acceptance* and use of the simulation modeling technique are next dealt with in some detail.

Projection of Student Credit Hours by Organizational Unit

As a key in the determination of faculty staffing, it was assumed that the ability of the model to project student credit hours by organizational unit would be the aspect of the model most vulnerable to skepticism. Accurate projections were dependent upon (a) the accuracy of the institutional enrollment projection and (b) the ability of the model to distribute the total institutional student credit hours to the organizational units.

Surprisingly, little skepticism or questioning of the model's projective ability was put forward by the participants. In fact, possibly an excessive degree of credibility in the model's ability to project student credit hours by organizational unit was attributed by the participants. An example of such a situation occurred early in the process. The Division Chairmen,

Table 1
STUDENT CREDIT HOUR PROJECTIONS
CONCORD COLLEGE, FALL SEMESTER 1974

DIVISION	ACTUAL FALL 1974 SCH PRODUCED	DIVISION CHAIRMAN ESTIMATE (a)			RRPM 1.6 SIMULATION MODEL (b)		
		SCH ESTIMATE	ERROR	ERROR %	SCH ESTIMATE	ERROR	ERROR %
Business & Economics	3398	3006	392	− 11.5%	3196	202	− 5.9%
Education, Health, & Home Economics	4223	4577	354	+ 8.4%	4325	102	+ 2.4%
Fine Arts	3722	5436	1714	+ 46.1%	4051	329	+ 8.8%
Language & Literature	3201	4030	829	+ 25.9%	3525	324	+ 9.2%
Natural Sciences	5083	5868	785	+ 15.4%	5042	41	− .8%
Social Sciences	5217	6187	970	+ 18.6%	5500	283	+ 5.4%
TOTAL	24844	29104	4260	+ 17.1%	25639	795	+ 3.2%

(a) These estimates were made in the Fall Semester 1973 by each Division Chairman.
(b) RRPM 1.6 Simulation Model run was made in Fall Semester 1973 on a projected FTE enrollment of 1709 students.

in an effort to bring their judgment into the student credit hour projection aspect of the model, were asked to estimate on a percentage basis the distribution of Fall 1975 lower division (freshman and sophomore) student majors. They were supplied with similar data for Fall 1974 and it was hoped that their closer contact with the students would permit a "judgmental" input into shifting institutional student major selections. Approximately half of the Division Chairmen commented that they felt that this was something best viewed from a "statistical" viewpoint by the Office of Institutional Studies and one refused to provide an input because he was "new here this year and would foul up the process."

Why was this potentially very controversial issue avoided? Relative credibility was achieved as a result of several events. *First*, the institutional enrollment projections provided by the Office of Institutional Studies since its establishment had proven considerably more accurate than previous projections. *Second*, the previous year's experience had illustrated the simulation model's ability to project with reasonable accuracy the distribution of student credit hours by organizational unit. *Third*, the model served to "protect" the Division Chairmen from the rampant optimism of one another regarding growing course enrollments. At the close of one prolonged meeting, the President asked the Division Chairmen, "How is it with all the

Table 2

SIMULATION MODEL DATA FORMAT USED BY PARTICIPANTS, CONCORD COLLEGE, WINTER 1975

PROJECTED		ALTERNATIVE ADOPTED			STAFFING CONSTRAINTS		
STUDENT CREDIT HOURS, FALL SEMESTER 1975	ORGANIZATIONAL UNIT	PRODUCTIVITY PER FTE	FTE FACULTY	DIFFERENCE FROM FALL 74	TERMINATION AS OF MAY 75	TERMINATION AS OF MAY 76	TENURED
3282	Business	395	8.32	----	2.00	----	6.32
616	Economics	616	1.00	– 1.00	1.00	----	1.00
3898	DIVISION OF BUSINESS & EC	418	9.32	– 1.00	3.00	----	7.32
1719	Education	214	8.00	– 1.61	2.61	1.00	6.00
174	Health Education	(a)	----	– .62	.62	----	----
314	Home Economics	179	1.75	– .39	.39	----	1.75
188	Library Science	250	.75	----	----	----	.75
1218	Physical Science	293	4.16	– .23	2.18	1.00	1.21
94	Safety Education	376	.25	– .15	.15	----	.25
3707	DIVISION OF ED, HMEC, & PE	249	14.91	– 3.00	5.95	2.00	9.96
1028	Art	283	3.63	----	1.00	----	2.63
1649	Music	281	5.86	– .30	2.80	----	3.36
947	Speech & Dramatic Arts	368	2.57	– 1.50	1.75	.75	1.57
3624	DIVISION OF FINE ARTS	300	12.06	– 1.80	5.55	.75	7.56
2871	English	372	7.70	– 2.00	3.00	1.00	5.70
120	French	120	1.00	----	----	----	1.00
35	German	140	.25	----	----	----	.25
192	Spanish	255	.75	----	----	----	.75
3218	DIVISION OF LANG & LIT	332	9.70	– 2.00	3.00	1.00	7.70
1644	Biology	411	4.00	– 1.00	1.00	----	4.00
561	Chemistry	330	1.70	+ .50	----	----	1.20
287	Geology	957	.30	----	----	----	.30
1680	Mathematics	338	4.97	– 1.00	.64	1.00	4.33
43	Natural Science	187	.23	----	----	----	.23
693	Physical Science	392	1.77	----	----	----	1.77
344	Physics	310	1.11	----	.36	----	.75
5252	DIVISION OF NATURAL SCI	373	14.08	– 1.50	2.00	1.00	12.58
616	Geography	293	2.10	----	----	1.00	1.10
1502	History	290	5.17	----	1.00	1.00	3.17
141	Philosophy	188	.75	----	----	----	.75
762	Political Science	381	2.00	– 1.00	1.00	----	2.00
813	Psychology	525	1.55	– .25	.50	----	1.30
460	Social Work	242	1.90	----	.70	1.20	----
895	Sociology	447	2.00	----	1.00	1.00	----
5189	DIVISION OF SOCIAL SCI	333	15.47	– 1.25	4.20	4.20	8.32
24888	COLLEGE TOTAL	329	75.54	– [illegible].55	23.70	8.95	53.44
RESULTING AVERAGE 9 MONTHS SALARY IN INSTRUCTION			$13.966	(b) (+ 5.2%)			

(a) Due to reduction in faculty productivity ratio uncertain.
(b) Relationship to 1973-74 average professional salary in the category of instruction.

growing programs in each of your divisions, our College enrollment is continuing a steady decline?"

Use of Productivity Ratios as the Workload Measure

While some resistance to the use of productivity ratios (student credit hours per FTE faculty) as the workload measure was anticipated, it was assumed that such resistance could be reduced by several methods. *First*, all participants were made thoroughly familiar with the student credit hour to FTE faculty position approach to funding used by the West Virginia Board of Regents. *Second*, the impact of both "hours taught" and "average class enrollment" on student credit hours per FTE faculty was explained and demonstrated in several examples and tables. *Third*, productivity ratios for each semester, course level, and organizational unit in the College for the past three academic years were provided to all participants. *Fourth* all participants were provided with comparative productivity ratios by two digit Higher Education General Information Survey (HEGIS) categories for the eight public four-year colleges in West Virginia in the Fall Semester 1971 and 1972. In addition, it was planned that similar comparative data for the Fall Semester 1974 would be provided to the participants in the course of their discussions. Assuming that all of these techniques were successful in getting the participants to use the productivity ratios as the workload measure, it was planned that these productivity ratios would be used as *independent variables* with which to bring about changes in the number of FTE faculty per organizational unit. As often happens to those who "feed" when they lose touch with those who "need," things didn't develop as planned. While the usefulness of the model was not negated, the scope and method of its use were altered from that originally planned.

The concept of using productivity ratios as the workload measure was never completely accepted by the majority of the participants. While productivity ratios gained equal recognition with faculty "hours taught" as a measure of workload, "hours taught" remained under consideration as an important measure of workload. Why did "hours taught" remain under consideration as a measure of workload? *First*, it was a very simple measure more easily understood than productivity ratios by the participants. *Second*, "hours taught" had always been used before. *Third*, it related well to viewing academic administration "from the bottom up," or as a series of course offerings from which the curriculum and staffing requirements emerged, which was the perspective brought to the group by the majority (six Division Chairmen) of the participants. This is as opposed to a view "from the top down" in which the course offerings and staffing requirements flow from decisions reached at the institutional level concerning the nature of the degree programs, other educational services, and goals of the institution. *Fourth*, comparative productivity ratios from other West Virginia public colleges for the Fall Semester 1974 were not available. The only participant not to recommend continued use of simulation modeling at the College indicated that he believed that the most helpful service that could be provided to the Division Chairmen would be the provision of a set of national normative productivity ratios for staffing the disciplines. *Fifth*, continued reference to hours taught provided a mechanism for several of the Division Chairmen to attempt creating artificial sections (splitting 1 class of 14 into 2 sections of 7 students) in order to "keep the faculty busy" and justify current staffing levels in their organizational units.

Despite the less than complete acceptance of productivity ratios as the primary measure of workload, it was used quite successfully as a *dependent variable* which related possible current decisions to future workloads in the various disciplines. This use was ranked second among the ten possible uses of the simulation modeling by the participants.

Realizing that the use of the productivity ratios as an independent variable was more than "those who need" could completely accept at present, it became necessary to accept the Division Chairmen's use of productivity ratios as a dependent variable and reorient the approach to supporting the participants in that mode. To have pressed for use of productivity ratios as independent variables would have threatened the continued use of simulation modeling in reaching the College's staffing decisions.

FTE Faculty

It was originally planned that this data element would function as a *dependent variable* subject to change by consideration of various workload alternatives in each organizational unit. Instead, the participants focused immediately upon FTE faculty as an *independent variable* and utilized changes in it to determine resulting workloads in terms of productivity ratios.

Why did the participants arrive at this immediate fixation on "FTE Faculty"? The reasons are, of course, intertwined with their incomplete acceptance of productivity ratios as the primary workload measure; however, some relatively separate occurrences also stimulated this action. *First*, the Division Chairmen realized that staffing reductions were necessary and sought to protect their divisions which were represented by the current number of FTE faculty. *Second*, early in the proceedings the Division Chairmen arrived at an essentially political recommendation that the reductions be made "across the board" with each division losing an equal number. While this recommendation was not accepted by the President, its existence was repeatedly referred to by several of the Chairmen. *Third*, there existed a genuine "push" by some of the participants to "get it over with" regardless of the consequences. This "push" resulted in perhaps an unduly early preoccupation with alternative decisions before thorough consideration of workloads, degree programs, student enrollment, student placement, and other essential information.

Staffing Constraints

The staffing constraints in terms of notification dates and tenured FTE faculty contained in Table 2 were readily accepted by the participants. An equally significant constraint not apparent from the table was the curriculum required to support the existing institutional degree programs. The President, early in the negotiations, indicated his desire to retain as many existing degree programs as possible. Several of the Division Chairmen, recognizing this desire on the part of the President, used the argument that "I can't cut back in this discipline without destroying the degree program." In several cases this was undoubtedly true; however, due to the curricular foundation, the group was forced to "take the Division Chairman's word" for the accuracy of the statement. This argument, because of its essentially subjective, academic, or curriculum basis and its unlimited application, functioned as a much more significant constraint than did tenure or notification dates.

Average Faculty Salary Fall Semester 1975

An important additional variable in the simulation model was the effect of various staffing alternatives on the average faculty salary in 1974-75. The effect on this dependent variable of various staffing alternatives was reflected at the bottom ("the bottom line") of each simulation model report to the participants.

In order to establish the validity of this data element, a detailed explanation of the funding formulas and calculations used to arrive at the expected funding for the category of instruction in the 1975-76 budget was conducted. Once that funding level was established, a table depicting various staffing levels, the resulting average salary, and that salary's relation to current salaries in the category of instruction was drawn. With the help of that document, the results of various staffing alternatives on average faculty salaries were accepted, if unwelcomed.

Feedback from Participants

After having reached their decisions, the eight participants (President and Vice President, representing the central administration, and the six Division Chairmen) each replied to a single page questionnaire. The replies of the six Division Chairmen were intended to be anonymous; however, five of these six returns were self identified.

Six of the eight respondents indicated an affirmative response to the question, "Did the use of simulation modeling serve a useful purpose in arriving at the decisions made recently regarding Fall 1975 staffing?" One of the two negative responses to the question indicated that his personnel decisions were arrived at before the initiation of the simulation modeling and the modeling "substantiated the prior decisions." If this comment is taken as supportive of the current simulation modeling, seven of the eight participants reacted favorably to the use of simulation modeling.

What value or use did the participants find in simulation modeling? Those responding positively to the question regarding the usefulness of simulation modeling were asked to rank order ten statements describing possible uses of the model (some of the statements are quoted in the following comments). The participants, as a group, indicated that the model served well to: "provide a common set of data accepted by all," "open up the discussions by making the Division Chairmen more knowledgeable about each other's staffing considerations," and "relate possible current decisions to future faculty workloads in the various disciplines." The participants' rankings of two of these uses was expected; however, the strength of support for the use of the model to "open up the discussions" was not expected. The majority of the support given to that item came from the *Division Chairmen* and possibly could have resulted from the degree of candor which entered the discussions centering upon the quantitative results of simulation modeling. The support for this value perceived in the model's use by the participants would seem to provide at least partial refutation of the argument that relatively sophisticated management information techniques diminish the "judgmental" aspects of decision-making and establish a basis for arguing that such techniques provide a basis for more informed and objective participation by the decision-makers.

Also provided a lesser degree of support by the participants were the model's use to "allow for consideration of various enrollment mixes and levels" and "serve as a means for quantification of some of the results of essentially subjective considerations in the decision-making process." Each of these items received strong support from one or more of the participants.

The responses received from the central administration (represented by the President and Vice President) were in most instances in agreement with the Division Chairmen. However, the value attributed to the use of simulation modeling by the two subgroups varied in several instances. As previously noted, the Division Chairmen attached more significance to the value of the model in "opening up the discussions" than did the central administration. The central administration attached considerably more significance to the use of the model to "relate possible decisions to future workloads in the various disciplines." Finally, the Division Chairmen found the model's use more significant in the areas of "limiting unwarranted optimism on the part of individual Division Chairmen" and "quantification of the results of essentially subjective considerations."

In the final question posed to the participants, seven of the eight, or 88%, recommended continued use of simulation modeling at the College in support of future staffing decisions.

The responses to this simple questionnaire are certainly insufficient in number to infer such findings to a national population. However, they represent the first such research into the users' reaction to the use of simulation modeling in an institutional environment.

Conclusion

The decisions reached are perhaps the least important aspect of the case study. They were the result of prolonged consideration of data, value judgments concerning the future role of the College, and the abilities of individual participants to sway the group in favor of their point of view. The "judgmental" aspect of the decisions was not removed, only made better informed.

The future use of simulation modeling in decision-making at Concord College is apparently not in doubt. The President has directed that documentation from this year's use of simulation modeling be retained for future use and five of the six Division Chairmen have recommended continued use.

What strategies were most effective in gaining an 88% approval rate and recommendation for continuation of simulation modeling at Concord College?

1. The ability to *show* the participants that the model could project student credit hours more accurately than any other means.
2. Adaptation of the data format used by the participants to focus as simply as possible on the issues.
3. Explanation of *key* data elements establishing the validity of the calculations.
4. Willingness to adapt the planned use of the model to a slightly altered utilization by the participants.
5. The assumption of a neutral (non-advocacy) stance regarding where faculty cuts should be made.

These strategies and others will be required by institutional researchers who will apparently be facing similar institutional staffing problems in the years immediately ahead.

STAFFING REDUCTIONS

[1] For an explanation of this theory consult any one of a number of publications by Dr. Resuss Likert.

[2] Similar to "administrative team" described in several publications from the Institute for Higher Education, University of Georgia.

[3] Examples of these data are contained in various editions of the *Concord College Fact Book.*

[4] In public higher education in West Virginia FTE faculty is defined as follows: "Full-time equivalent is a statistical measure, it may or may not be synonymous with the number of individuals employed. . . . Each employee who is assigned less than a full load when employed is measured as a proportionate part of an FTE. Load determinations are the responsibility of the administration of each institution," West Virginia Board of Regents, (1974).

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A MODEL FOR ESTIMATING THE RANGE OF OUTCOMES OF SPECIFIED TYPES OF POLICIES BEFORE AND AFTER ADOPTION OR IMPLEMENTATION

David H. Zippin, Fairleigh Dickinson University

The problem confronting the originator of either slightly new, or truly innovative, policy in the context of an institution of higher education lies in determining the probable difference it may make with respect to the functional indices which are concerned.

As the title suggests, a methodology for policy analysis, having the pragmatic aim of estimation rather than of definitive prediction, is proposed. In particular, it is the aim of this report to explore an application of policy analysis that does not use the classical time-series method (Campbell, 1969), but rather seeks to determine ranges of specified policy consequences apart from the study of changes over time. Since the approach explicated here is independent of time-based policy research, it may be applied both before a policy has been adopted and implemented, as well as after implementation.

Therefore, the estimation approach suggested here is not offered as a replacement for temporal comparisons, but as a pragmatic adjunct to the latter, useful where a decision needs to be made regarding a policy, where there is a lack of relevant time-based research where the time elapsed after adoption is insufficient to permit reliable assessment of measures of change, or where the data needed for an effective application of the time-series approach are incomplete.

The Approach

Several steps are involved in the methodology:

1. *Selecting es:* A determination is made based on prior related research, or based upon the policy analyst's understanding of the policy in question, of the factors which are likely to provide a useful analysis of the reslts of the policy. Scott and Shore (1974) have designated such factors "tractable variables." In selecting relevant dimensions, the initial strategy consists of asking "what variables are likely to account for the impact of the policy?"
2. *Data organization:* The second step involves the determination of which of the selected estimation variables are available in the form of records data or data archives either within the university or within an external institution. If the relevant data is not previously collected and stored, purposive collection of pertinent indices of the estimator variables may be in order.
3. *Weighting the estimators:* A cross-classificatory property space is established incorporating the principal estimation variables. Each cell in the cross-classification is then assigned a weight derived from the anticipated impact of each of the estimator variables upon the index which the policy analyst wishes to estimate. An alternative weighting method is to assign a weight to each of the individual categories of each estimation variable, and sum the weights for each cross-classificatory cell. Several alternative sets of weights may be applied in order to ascertain various estimated outcomes of a policy, according to the differential relative contribution of each of the estimators.

Regardless of the number of alternative weighting schemes that may be attempted, the approach consists of generating a multivariate weight which represents the proportion of the total number of cases eligible to be influenced by a policy which are, in fact, estimated as affected.

4. *Applying the weights:* The computational application of the multivariate weights consists of the multiplication of the total population of cases eligible for the effect of a policy by the former.

Case Study

Of the various types of policy studies that might be undertaken by a university administration, *enrollment policy* was designated as a basic area subsuming many other policy issues. The basic enrollment policy dimensions are those which may effect a change in the *size* of the student body, or in its *composition*. Related to enrollment size is, of course, the key variable, tuition.

In February 1974 Fairleigh Dickinson University announced that it would introduce, with the Fall semester, a tuition reduction for families enrolling two or more of its members. Designed to assist families faced with the high cost of sending two or more of its members to college at the same time, the Plan is applicable to full-time undergraduates only. It provides a 50% tuition reduction for the second and each subsequent concurrently enrolled dependent child, and for the second member of a married couple in full-time attendance at the University.

The Fairleigh Dickinson University Plan may be understood, on the one hand, as a type of financial aid likely to increase the attractiveness of the institution for the eligible families. On the other hand, the Plan may serve to reduce the strain between family and school, postulated by Litwak and Meyer (1967).

The estimation methodology was developed to estimate the probable impact of the Plan specifically for the families with multiple eligible children within the state of New Jersey.

1. *Data Selection:* The following information was incorporated:
    a. *1970 Census One-In-One-Hundred "Public Use Sample"*
    Families with children between 13 and 17 years of age at the time of the 1970 Census were isolated for analysis. For these families which contain children in their first, second, third, or fourth year of college

as of 1973-74, a cross-classification was constructed between eight categories of family income (less than $4,000/ $4,000-$7,999/ $8,000-$9,999/ $10,000-$12,499/ $12,500-$14,999/ $15,000-$19,999/ $20,000-$24,999/ $25,000 and up) and three categories of family size (two children/ three children/ four or more children). This 24 cell table was obtained from the Bureau of the Census for each of the 16 counties or county groups in New Jersey (Hudson/ Bergen/ Passaic/ Essex/ Morris/ Union/ Hunterdon-Somerset-Sussex/ Middlesex/ Monmouth/ Mercer/ Cape May-Ocean/ Atlantic-Cumperland/ Burlington/ Camden-Gloucester/ Salem/ Warren).

b. *Tuition Data*
1973-74 tuition for full-time students was obtained for each four-year private, four-year public, two-year private, and two-year public educational institution in New Jersey. For public two-year colleges, in-county and out-of-county tuition costs were obtained.

c. *Fairleigh Dickinson University 1973 Enrollment*
For 1973-74 the full-time undergraduate enrollment was obtained and broken down by campus and New Jersey county. A 1974-75 extrapolated enrollment was computed by adding the average annual increment per campus over the period 1969-1973 to the 1973 enrollment by campus.

d. *Enrollment of Other Institutions*
For each public, private, four-year, and two-year institution in New Jersey, total full-time enrollment was obtained and broken down by New Jersey county.

2. *Assumptions and Procedures*

a. *Weighting Family Income and Family Size*
In order to estimate numbers of families likely to be affected by the Plan, assumptions as to the probable impact of the Plan's effect on tuition levels upon each category of family income, and upon each category of family size need to be established in the absence of empirical evidence. Such assumptions should be based on a theoretical model, which, in turn, is based on a tentative evaluation of the relevance of each family income and family size category to the Plan's tuition product.

In weighting family income it is assumed that multi-child families with typical income levels will be more likely to be affected by the Plan. On the one hand, this assumption rests on the observation that the majority of families are in the typical income range (at or near the average income), and upon the further assumption that families either well below or well above the typical income range are less likely to be influenced by the Plan—poorer families being less likely to send their children to Fairleigh Dickinson University and the more affluent being less concerned with the level of tuition.

For multi-child families in New Jersey, the pooled average income for the 16 county categories was $13,824 (Public Use One-In-One-Hundred sample, 1970). The mean income for families of full-time freshmen at Fairleigh Dickinson University for 1973, as determined from 1,238 respondents to the American Council on Education student information form, was $13,185. These values are contained in the family income category $12,500-$14,999, as established by the Bureau of the Census, which is here assumed to be a category most likely to respond to the Plan, assuming further that income is approximately normally distributed, and that the largest frequencies of multi-child families will cluster about the mean income.

To broaden the definition of the "most likely" income category and to include a larger number of cases for the estimation, families with incomes between $10,000 and $12,499 were grouped with the $12,500 through $14,999 category to provide a middle-income group whose financial resources would probably permit serious consideration of Fairleigh Dickinson University and whose financial stresses would be considered more or less acute.

b. *Family Size*
It was necessary, in setting weights of the categories of family size (two, three, four or more college age children), to select that category likely to be most influenced by the Family Plan. It is probable that families with four or more college age children are more likely to take advantage of the Family Plan than three-child families. In turn, three-child families are more likely to use the Plan than two-child families. The rationale for this ranking of effects of family size categories is that the more college age children there are in a family, the more likely it is that the family's financial resources will be over extended.

c. *Weighting Procedure for Family Income and Size*
The weighting scheme is based on the postulated effect of the Plan on each category of family income, assuming that the effect decreases in a step-wise manner as the income level either increased or decreased with reference to the middle-income category described above ($10,000-$14,999). This results in a curvilinear weighting with maximum weight for families in the latter category, and weights for categories above and below decreasing progressively with increased distance. The weighting used for categories of family size is merely linear with the greatest weight assigned to the four or more child category and the remaining two size categories weighted in decreasing order.

d. *Combined Weights for Family Income and Size*
Each of the 24 cells of the family income by family size cross-classification was assigned a weight factor incorporating the combined weight characteristics of the two variables. To permit the determination of a liberal estimate of the numbers of families likely to use the Plan, cells having the highest weighting of family income and family size were weighted as if 10% of the families in those cells would be affected. Ten percent as an upper limit seemed a realistic extreme upon which upper limit frequencies could be based.

Operationally, weights were assigned to each cell of family income by family size as shown in Figure 1.

e. *Weighted Proportion: Computation and Use*
Following application of the weighting percentages above, a ratio of the sum of multi-child families to the total number of families was calculated for each of the 16 census county groups in New Jersey. This

ratio has two applications: (a) estimating the number of families of students already enrolled at Fairleigh Dickinson University likely to be influenced by the tuition plan (the product of the weighted proportion and the 1973 frequency of total full-time undergraduates enrolled at Fairleigh Dickinson University for the particular county group); and (b) estimating the number of families of full-time students enrolled at two- and four-year New Jersey undergraduate institutions other than Fairleigh Dickinson University which would be affected by the Plan (incorporating a weight for the tuition level at that institution and the frequency in full-time attendance at each institution in 1973 from that county group).

In addition, it is postulated that those families of students at other institutions where the 1973 full-time tuition is close to the 1973 full-time tuition level at Fairleigh Dickinson University will be more likely to take advantage of the tuition plan than those at institutions where the tuition level is significantly different. Thus, the above product has been weighted by the percentage of full-time tuition at Fairleigh Dickinson University being currently paid by students as tuition to other institutions. This acts as a secondary weighting to the product of the per county weighted proportion and the frequency to attend an institution from that county and, in effect, reduces the estimate of the number of families likely to be affected by the Plan to the extent that the tuition level differs from Fairleigh Dickinson University's.

3. *Results*

Table 1 and Table 2 contain the summarized estimates for the Fairleigh Dickinson University Family Plan effects.

Figure 1

FAMILY SIZE

family income	two college age children	three college age children	four college age children
Less than $4,000	1%	1%	1%
$4,000-$7,999	2%	3%	4%
$8,000-$9,999	5%	6%	7%
$10,000-$12,499	8%	9%	10%
$12,500-$14,999	8%	9%	10%
$15,000-$19,999	5%	6%	7%
$20,000-$24,999	2%	3%	4%
$25,000-or more	1%	1%	1%

Figures in each cell are the proportion of observed families in that cell likely to use the Family Plan.

Table 1

ESTIMATED NUMBER OF MULTI-CHILD FAMILY TYPES WITH A CHILD CURRENTLY ENROLLED IN A NEW JERSEY FOUR OR TWO-YEAR COLLEGE TO BE AFFECTED BY THE FAMILY PLAN.

County of family residence	Enrolled in FDU			Enrolled in four-year institutions						Enrolled in two-year institutions					
				Public			Private			Public			Private		
	2^a	3^a	4^a	2^a	3^a	4^a	2^a	3^a	4^a	2^a	3^a	4^a	2^a	3^a	4^a
Hudson	5.25	.94	.56	19.88	3.55	2.12	38.32	6.85	4.09	1.91	.34	.20	.88	.16	.09
Bergen	29.38	6.40	.36	35.62	7.75	.44	30.73	6.69	.37	9.24	2.01	.11	3.20	.70	.04
Passaic	7.05	2.35	.31	21.24	7.08	.94	13.10	4.37	.58	2.67	.89	.11	.98	.33	.04
Essex	12.66	2.96	.35	49.28	11.51	1.37	58.16	13.58	1.62	11.49	2.65	.32	.96	.22	.03
Morris	20.98	3.33	1.28	31.87	5.05	1.94	46.03	7.30	2.81	22.42	3.55	1.37	3.16	.50	.19
Union	13.63	1.86	.12	53.82	7.34	.49	50.81	6.93	.47	15.54	2.12	.14	1.14	.16	.01
H-S-S	4.76	.90	.16	14.90	2.83	.51	20.06	3.81	.69	9.24	1.79	.32	1.79	.34	.06
Middlesex	3.60	.79	.04	35.24	7.71	.35	25.28	5.53	.25	10.03	2.19	.10	.19	.04	.00
Monmouth	2.19	.45	.08	13.87	2.84	.48	31.77	6.50	1.10	1.57	.32	.05	.39	.08	.01
Mercer	1.06	.29	.06	8.55	2.31	.46	21.57	5.83	1.17	15.13	4.09	.52	.10	.03	.01
C-M-O	1.23	.43	.13	7.06	2.48	.76	10.14	3.57	1.10	7.31	2.57	.79	.03	.03	.01
A-C	2.60	.59	.10	18.10	4.10	.69	7.21	1.63	.27	10.63	2.41	.40	.02	.00	.00
Burlington	1.14	.46	-	11.18	4.55	-	9.59	3.90	-	5,79	2.36	-	.09	.04	-
C-G	1.55	.39	.04	29.99	7.64	.77	9.24	2.35	.24	11.38	2.90	.29	.12	.03	.00
Salem	.12	.02	.00	1.64	.22	.02	.70	.10	.01	7.23	.98	.07	.25	.03	.00
Warren	.47	.05	.01	1.20	.13	.02	2.95	.33	.05	.49	.05	.01	1.06	.12	.02
Total	107.67	22.21	3.6	353.44	77.09	11.36	375.66	79.27	14.82	142.25	31.25	4.8	14.36	2.81	.51

Note ª designates number of children of college age in family.

395

Table 2

ERROR WEIGHTED FREQUENCIES OF NUMBERS OF FAMILIES LIKELY TO USE THE "FAMILY PLAN", WITH CORRESPONDING TUITION INPUT** (ERROR WEIGHTING IS APPLIED TO ESTIMATES BASED UPON A 10 PERCENT UPPER LIMIT TO USAGE OF THE PLAN.)

ERROR WEIGHT	F.D.U. ENROLLED		4 YEAR PUBLIC		4 YEAR PRIVATE		2 YEAR PUBLIC		2 YEAR PRIVATE		TOTAL	
	FREQ.	TUITION	FREQ.	TUITION	FREQ.	TUITION	FREQ.	TUITION	FREQ.	TUITION	FREQ.	TUITION
(A) ALL 16 NEW JERSEY COUNTY GROUPS												
100%	133.4	140,870	442.0	1,400,256	469.8	1,488,326	178.6	565,804	17.6	55,756	1,241.4	3,151,014
75%	100.1	105,705	331.5	1,050,192	352.4	1,116,403	134.0	424,512	13.2	41,817	931.1	2,738,305
50%	66.7	70,435	221.0	700,128	234.1	742,579	89.3	282,902	8.8	27,878	620.7	1,825,507
25%	33.3	35,164	110.5	350,222	117.4	371,923	44.7	141,609	4.4	13,939	310.4	912,016
5%	6.7	7,075	22.1	70,012	23.5	74,448	8.9	28,195	.9	2,851	62.1	182,582
(B) SEVEN HIGH PROBABILITY COUNTY GROUPS												
100%	116.8	123,340	314.7	996,969	312.3	989,366	98.3	311,414	14.8	46,886	856.9	2,467,976
75%	87.6	92,505	236.0	747,648	234.2	741,945	73.7	233,481	11.1	35,164	642.6	1,850,745
50%	58.4	61,670	157.4	498,643	156.2	494,841	49.2	155,865	7.4	23,443	428.6	1,234,463
25%	29.2	30,835	78.7	249,321	78.1	247,420	24.6	77,932	3.7	11,721	214.3	610,895
5%	5.8	6,124	15.7	49,737	15.6	49,420	4.9	15,523	.7	2,217	42.7	123,023

1. *Error Weights:* Percentages are applied as proportions of the estimated frequency of persons in each category of institution to provide a range of effects of the family plan. If 75% , for instance, are effected, this amounts to a 7.5% response, based on the 10% upper limit used in the original weighting, etc.
**This is a conservative tuition estimation based on the assumption of only one individual being induced from those families which have an F.D.U. enrolled continuing student and of only two persons being attracted by the "plan" for cases having no F.D.U. continuing student. The rationale for this approach is the overwhelming preponderance of two-child (or person) family plan users. Average tuition calculated as $2,112.

Summary of Findings

1. Estimated ranges of students to be added by the Plan in Fall 1974 and 1975:
    a. Plan-induced siblings of continuing F.D.U. students 117 - 133
    b. New students with siblings 74 - 111
    TOTAL (a + b) 191 - 244
2. Ranges of tuition value of the estimated additional students:
    a. For siblings of continuing F.D.U. students (1/2 tuition) $123,340 - $140,870
    b. For new students with Plan-eligible siblings (full tuition) 77,933 - 117,004
    c. For siblings of (b) (1/2 tuition = $1,056) 38,966 - 58,502
    d. Combined tuition input for both new students and their siblings 116,899 - 175,507
    e. Tuition input for *all* Plan induced students 240,239 - 316,377
3. A tuition decrement is associated with the Plan. The size of the decrement depends on whether it is measured by:
    a. the sum of tuition loss resulting from participants who were enrolled and paying full tuition prior to Plan implementation.
    This represents the lower end of the decrement range and, based on 9- continuing student siblings at one-half tuition, produces a decrement of $96,096;
    b. the difference in tuition level between that produced by the Plan and that which would have been generated by the same number of added students without Plan.
    This is the higher end of the range and amounts to $288,096.
4. A range of net tuition gains results from a consideration of the factors described under findings (2) and (3).
    a. Lower decrement limit $144,143 - $220,281
    b. Upper decrement limit 12,143 - 88,281

Some Further Applications

The approach described and applied to the Fairleigh Dickinson University Plan may be tailored and applied to other policy issues where it is feasible to establish rational estimation weights and the magnitude of the population to which the policy would both be communicated and would apply:

1. *Financial Aid Policy*
    a. One obvious extension is the use of estimation at other educational institutions which might consider developing a policy similar to the Fairleigh Dickinson University Family Plan.
    b. A second area of application consists of policies involving a changed distribution of financial aid. In this category would be those policies which involve the differential distribution of aid among diverse groups (academic ranks, ethnic groups, sex) and those policies which might attempt to achieve a more dispersed distribution of financial aid among a larger student group than may be the case under the ongoing policy.

2. *Additional Selected Policy Applications* There are a number of policy issues which may be approached with an estimation method where archive data or other data base for estimation variables may not be readily available. For issues regarding policy changes relevant to areas for which student preferences may be involved (e.g., program offerings, course offerings, grading procedures, advisement procedures, the structure of student electives and requirements), a preliminary market type of study may be designed and executed to determine the preferences of the pertinent populations as a precursor to generating estimated ranges of students likely to be induced. Once the background characteristics of potential students, which are appreciably correlated with the preference for the innovative program, course grading procedure, etc. are established (if, in fact, they exist), such dimensions may be used in obtaining estimated frequencies of probable induced students in the manner suggested above.

For the latter type of combined market analysis and estimation approach, the strength of the correlation of the estimation variable with preference for the new policy may be used to establish the appropriate estimation weights.

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THE EFFECTIVENESS OF COMPUTER PLANNING MODELS IN PLANNING FOR MEDICAL CENTERS

Frank S. Zilm,
Stone, Marraccini and Patterson

With the increasing access to computer hardware and availability of sophisticated programs, mathematical modeling has become particularly promising as a planning tool. This researcher has attempted to assess the current effectiveness of modeling in planning for medical centers through the analysis of relevant organizational and small group behavior and through the study of five applications of modeling to strategic medical center planning issues. The case studies included two large public institutions in the United States and Canada, two private university-based medical centers, and a small New England public university. While the sample size and case study research method prevents statistically verifiable results, it is hoped that the findings can provide new insight to guide future work.

Organizational Factors in Planning

Before the case studies can be evaluated, it is necessary to develop two working hypotheses about the current state of strategic planning in large organizations.

First, as with most modern organizations, the real decision-making power at medical centers does not reside in the top of the organizational chart of the university, but is controlled by middle management and departments. As Bucher (1969) found in the analysis of a large medical school, power over curriculum content, hiring, firing, and control over physical space reside in the department: "Without a doubt, departments are the major arenas in the medical school. It is in and through the departments that most of the life of the institution is lived" (p. 12). This shift down the organization in decision-making has two direct effects on planning. First, it must be understood that the objectives of the decision-makers are not necessarily the same as the overall objectives of the organization by which they are employed. A rational planning decision for a department chairman may not be the most rational alternative for meeting the school's objectives. Decision-making requires an ethical or judgmental foundation, and that base is frequently influenced by the existing location and reward system in which an individual must operate.

The other major implication of this concept of decision-making is that the identification of alternative development patterns are generated upward from within the organization. These alternatives frequently represent the result of political compromise within the units which tend to restrict both their number and the innovative characteristics of the plan. This in turn encourages the perpetuation of the status quo as Sarason (1971) cites:

> Settings, whether they be young or old, almost never have a vehicle or mechanism devoted solely to the description or examination of the universe of alternatives. If anything becomes clear in the process, it is how one's biases drastically reduce one's awareness of alternatives which are both logical and consistent with one's own values. (p. 69)

In the environment of controlled and limited alternatives definition, it is not surprising that a major characteristic of decision-making in the public sector is labeled the Policy of *Incrementalism*. Analyses and models developed by Cyert and March, Cherryholes and Shapiro, and Crecine have shown that the budgeting process in federal and other organizations can be predicted with amazing accuracy by projecting sub unit budgets in an incremental pattern based on immediate historical rates of change. Work done by Michael (1970) has demonstrated that the pattern of incrementalism can be extended to long range planning:

> While within a very, very few organizations there are the small, very small, beginnings of trying to design and implement long range planning, there is essentially no planning that looks to alternative futures for the society in which they hope to operate and then alters present goals and styles so as to attain or avoid those futures. . . . Taking seriously a future that jeopardizes present successful allocations of status and rewards is simply too threatening to be acted on. (p. 7)

The second working hypothesis is that the specific organization of long range planning can affect the final product. One of the most common methods used in planning is the committee structure. The small group setting is usually established to assure some form of representation in decision-making by the potentially affected areas of a system,and to assure that the difficult policy issues inherent to the process are resolved through more than one individual perspective. Again, Bucher's (1969) study indicates the power of the committee structure:

> If departments are the sites where most of the work of theinstitution is carried out, committees are the major interdepartmental arenas. . . . I have placed such stress upon the committee arena because once a recommendation has survived the committee structure and is placed before the faculty, it almost always gains faculty approval. (p. 45)

Small Groups and Planning

While there has been extensive work completed in the area of small group dynamics, few studies have specificallyexamined the long range planning environment. In an effort to assess the impact of small group behavioral patterns on decision-making, a detailedanalysis of interaction at a series of planning meetings was initiated. Interaction by planning committee members at a medical center were recorded for seven consecutive meetings. While it was impossible to document all interactions because the committee size, over 9,000 acts were categorized by sender, intended receiver, and type of interaction (Zilm 1975). Analysis of the results reveals several significant similarities and differences when compared to the behavior expected from small group literature.

The tendency for high power status individuals to initiate more communications is one of the most powerful and reliable phenomena delineated by experimenters. In the planning group studied, the highest initiator of acts was the Dean of the medical school. Of his interactions 32% were directed to the group as a whole, another indicator of high status. The top 5 interactors initiated over 57% of the total acts, with the remaining 43% of acts spread among the other 14 participants over the 7 meetings.

Four of the top five interactors were either top level medical school administrators or planners. The other 14 participants included nursing school, hospital and university administrators, along with planning support staff. The average number of acts for the top 5 members was almost 4 times higher than for the remaining 14. High interactors would communicate primarily among themselves, while lower interactors overwhelmingly directed their acts upward to high interactors, mostly in the context of acts of support.

A significant example of the impact of status on group behavior occurred when four of the five top interactors missed one of the planning meetings. The members attending the meeting interacted at a rate five times higher than their rates at other meetings. Except for one individual, at least 50% of each member's total interaction was observed at that meeting. Since the agenda item was identical to the previous meeting which the members attended, it would appear that the committee participants adhered to a role and status relationship.

Most of the committee participants shared a similar view of the organization. A Bales Spatial model of communications networks places all the committee members except one in a location indicating support and acceptance of the small group tasks and organization's goals. Examination of the type of interaction initiated indicates that the committee showed less disagreement among members than laboratory study groups. This may be a result of the need to maintain group cohesiveness over the long life span of the committee. This is supported by a higher than expected level of joviality among members.

In summary, although decision-making power has moved down the overall organization structure, high status administrators and planners dominate interaction and decision-making. Idea initiation and problem-solving suggestions from lower status members are stifled. There are few deviants from the accepted organizational view or group task to act as a stimulus to non-intuitive solutions to problems. The long term planning committee appears to be more concerned with maintaining group balance and cohesiveness than typical small groups. One area which could not be studied in detail, but may provide fruitful insight into behavior, is the process and effect of coalition formation among committee members.

It is within this environment that computer modeling has been proposed as a viable method of rendering decisions objective and rational. It would appear logical that if models are used and injected into the small group decision-making process by high status members, then there is a high probability that they will be effective in impacting planning decisions. This, however, is not the normal domain or interest of high status group members. If modeling information is presented by low status group members, the information's utilization may result in a shift in status because of the expertise power exhibited. Unless special modification of normal group behavior is structured into the use of mathematical models, serious questions can be raised to their chance of success when presented by low status committee members. Unfortunately, committee behavior could be observed at only one of the five case study institutions.

Case Study Models

The case study modeling projects encompassed a wide range of scale and modeling techniques in addition to a range of institutional characteristics.

The projects studies include:

I. A series of simulation models of clinical services designed to assess the teaching capacity and physical resources needed for inpatient surgical services.

II. A large scale general modeling system consisting of an input/output model of undergraduate education and two linear programming models of clinical education and department budgeting.

III. A major attempt to modify and utilize the models developed in case II at a different institution.

IV. A comprehensive program-oriented financial and staffing modeling system.

V. A small scale linear programming model designed to determine the teaching capacity of clinical services.

A detailed description of the projects, the techniques used, and the planning environment was formed from implementation of one of the projects and analysis of interviews with key individuals.

In addition to attempting to assess the direct and indirect uses of the projects, seven characteristics of each case study were evaluated. The characteristics identify major organizational behavior and procedures which the literature indicates could influence modeling effectiveness:

Variable	*Characteristic Identified in Case Studies*
1. Ability to identify non-traditional alternatives	Planning alternatives identified (yes, no)
2. Internal cooperation in planning	Internal organizational problems (yes, no)
3. Integration of modeling with planning	Modeling undertaken within organizational planning (yes, no)
4. Ability to obtain information required for model	Large scale data collection required (yes, no)
5. Time required to respond to planning issues	Major time requirement—one year or longer (yes, no)
6. Cost of modeling	Significant project costs—$30,000 or greater (yes, no)
7. Complexity of model	Large scale model (yes, no)px

The results of the case studies are illustrated in Figure I.

Three of the characteristics were consistent among all the case studies. Those characteristics dealt with the technical aspects of modeling. All of the institutions studied required large scale data collection efforts, major time commitments and costs.

Data collection activities were centered in three areas:

1. Collection of quantitative information on the system being modeled;
2. Estimates of the desired utilization of specific resources; and

Figure 1

MAJOR CHARACTERISTICS OF CASE STUDY PROJECTS

	Output of Model used in Planning	Data or policies in Model Used	Planning Alternatives Identified	Internal Organizational Problems	Modeling Undertaken Within Organization	Large Scale Data Requirements	Major Time Requirements	Significant Project Costs	Large Scale Model
Case Study I		X		X	X	X	X	X	
Case Study II		X		X		X	X	X	X
Case Study III		X				X	X	X	X
Case Study IV	X	X	X		X	X	X	X	X
Case Study V	X	X	X		X	X	X	X	

X = Yes

3. Forecasts of future environmental factors which could affect the behavior of the real system.

It would appear naive for a model builder to assume that even some of the most basic data needs will be readily available, internally consistent or retrievable even if the data exist. What is interesting is that the type of information cited forms the base of *any* logical planning approach, regardless of the use of models.

All of the projects required at least one-and-one-half man years of effort to complete, and cost estimates ranged from $30,000 to $280,000. Initial implementation of a mathematical modeling approach will require significant time, manpower, and organizational commitment.

While all the institutions cited important indirect benefits from their modeling activities, only two institutions appear to have utilized their models in the establishment of strategic planning decisions. Some of the indirect benefits cited are:

1. Better understanding of the overall system being planned and the interrelationship of its components.
2. The collection of information necessary for other planning activities.
3. The validation of existing and new information.
4. Focusing of planning efforts on identifying future conditions in quantitative terms.
5. Identification of policies affecting planning.

6. Initial definition and quantification of value criteria.

The level of precision, accuracy, definition of policies, and discipline necessary in modeling may be its primary benefit when compared to other planning activities. The education to planning staff can be an invaluable and frequently underemphasized asset.

Two factors may explain the lack of direct utilization of models in three of the studies. Two of the projects were either directly or indirectly involved in major internal political controversy. Conversely, the other modeling project was implemented in such a stable environment that no significant future alternative configurations have been identified. All of the case studies found utilization constrained by limitations in identification of future environments.

Conclusion

While there is ample evidence that planning models can have a significant role in planning, it is important for future efforts to learn from the past. Use of the techniques must be conceived within the context of the organizational process affecting planning and should not be perceived as a panacea. Institutions considering the implementation of planning models should pay particular attention to:

1. The objectives, timetable, and budget;
2. Staffing; and
3. Procedure for implementation.

The objectives should be clear and realistically achieveable. While capabilities of particular modeling techniques are potentially unlimited, planning of the project must address what can be done within the time and information constraints in existence.

Staffing can be a difficult task. Individuals with analytical training, planning experience, and knowledge of health systems are not available in abundance. Additional project time may be necessary at the initiation of the project for staff to gain necessary experience. Outside consultants may also be helpful in the initial stages of development.

Successful implementation appears to be contingent on five factors:

1. Timing relative to other planning activities.
2. Clarity of the proposal to decision-makers and others involved in the project.
3. The appropriateness of the specific technique utilized.
4. Integration of project staff into other planning activities.
5. Direct, understandable output and analysis of the implications.

It is significant that all the individuals interviewed felt that the projects studies were beneficial to their planning, regardless of whether the output was directly utilized. With the continued exposure and refinement of methods, mathematical modeling has potential as a significant component of long range planning. Before that potential can be utilized, however, major improvements in planning organization must be achieved. This will require a concerted effort to understand the process of decision-making in long range planning and indentification of possible intervention techniques to improve the current state of the art.

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Michael, D. On the social psychology of organizational resistances to long range social planning. *Symposium on technology in organizations of the future.* Ithaca, N.Y.: Cornell University, 1970.

Sarason, S. *The creation of a community setting.* Syracuse: Division of Special Education, 1971.

Zilm, F. *The effectiveness of computer modeling in planning for medical centers.* Ann Arbor: University Microfilm, 1975.

PREPARING THE TWO-YEAR COLLEGE FOR ACCOUNTABILITY

Gary A. Rice, Yakima Valley College

Anyone involved with higher education today will attest that, with less money to spend and no money to waste, the watchword is accountability. Rapid expansion of higher education, the sheer magnitude of the current enterprise, rising costs and inflation, and growing public insistence on stricter accountability have exerted tremendous pressure on institutional executives to get the most out of their resources. They are also being called upon to define the goals and objectives of their institution and relate them to the allocated resources. Besides external pressures there are other reasons for wanting new and better methods of studying the allocation and utilization of staff and materials. As the decision moves from its originator, the absence of intimate familiarity forces one to use objective, quantitative information. Also, leveling enrollments and stabilized budgets mean that no one gets a greater portion unless someone gets less. Since Lessinger (1973) originated the term "accountability" as applied to education, many notable university researchers including Balderston, Bowen, Cope, Doi, Dressel, Fincher, Havigurst, Peterson, Jedemus, Johnson, Lelong, Mason, Morishima, Saupe, Sheehan, Suslow, Sutton, NCHEMS at WICHE, *et al.*, have attempted to untangle this Gordian Knot. Their writings suggest, however, that the task will be monumental at best.

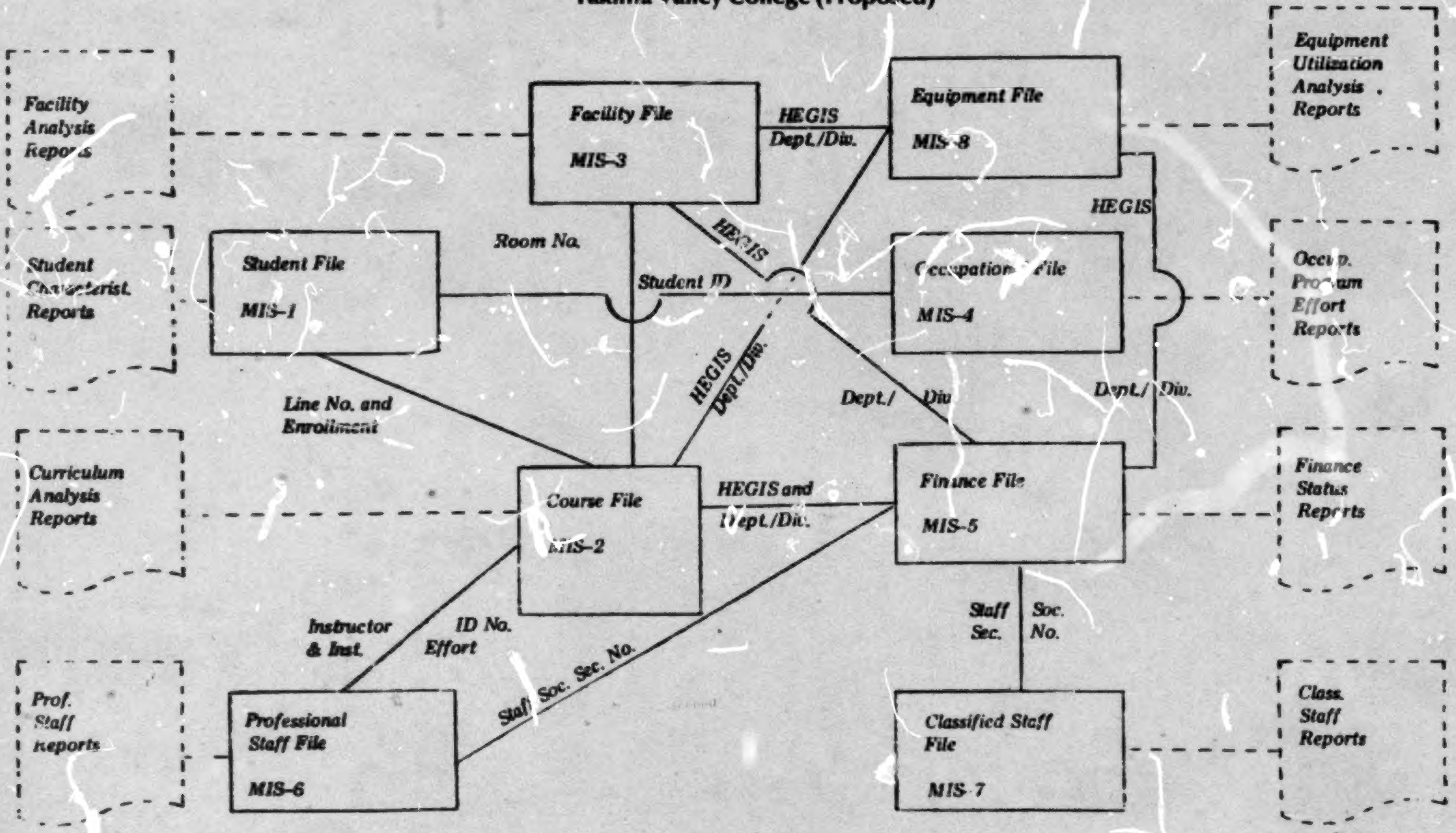
This paper will describe a locally created, computer-based MIS structure that encompasses and interlocks eight basic components of an institution's existence and operation. The cost accountability simulation models are then interfaced with the management information systems (MIS) data base and an example of the output is discussed. Several comments will be made on the task of implementation as well as tactics and strategies to involve the board, administration, faculty, and staff. A college goals/objectives accountability matrix will also be introduced and tied to the data base and simulation models. Finally, some benefits of this entire conceptual structure for the college will be cited.

Caveats

Before beginning several caveats need to be acknowledged. First, the system is currently constructed around only those elements that lend themselves to quantification to get it off the ground and gain credibility. Also the main focus is on the curriculum and instruction before moving onto administration, student personnel, library, physical plant, data processing, and other instructional support services. Second, since the model computer routines are both rational and logical and the output is dependent upon input, it must be assumed that the process and methods of procuring input are accurate, logical, rational, and represent an isomorphism with the institutional reality. Also the output language and format must be isomorphic with the college's existence. Third, the system deals exclusively with expenditures at this point, although attempts to tie them to revenue are being tested. Fourth, the operation of the system and models assumes there is some optimum combination of allocations that would make the most efficient use of the resources at hand. However, it was up to our college to define "most efficient use" in terms of its own priorities. At this stage they chose dollars as the only expended resource with full recognition that this was probably not the best way to delineate institutional efficiency. Fifth, this model is only a symbolic approximation of the real situation, more akin to an image or analogy than a precise scale model. Thus, one must beware of oversimplification and distortion in its use. A forecasting system, like the one to be proposed, functions as a heuristic device in the context of discovery rather than validation. Since models are never more than approximately valid, when it fails to describe or predict the world it is the model and not the world that must be abandoned. Sixth, although the emphasis of this paper is upon construction of a process system, there was a real awareness of the error of seizing simplistic efficiency indices and then compounding that error by choosing a process rather than an output measure as the appropriate productivity index. While some comparable measures have to be adopted, it is questionable to try for efficiency through increased departmental uniformity. Also any uniform approach to efficiency and effectiveness must reckon with different student capacities and motives. Thus, Yakima Valley College initially approached the task by determining and comparing complete departmental and student profiles and constructing an historical data base rather than settling for any unitary component. Seventh, because of the newness of this whole concept to our entire professional staff, they have requested that the planning process be initially brought to them. As the college ad hoc planning task force has gained sophistication, the planner's role has more appropriately become a technical advisor, facilitator, resource person, catalyst, and college-wide planning coordinator. Shortly, the division/department heads will become more involved through the task force members. Finally, as Lelong (1971) succinctly notes, the whole purpose for our cost modeling efforts is threefold: (a) it furnishes an unambiguous, highly specified, quantitative description of the major elements and their interrelationships within an institutional system; (b) it provides a reliable means of predicting the outcomes of actions changing major variables in the system; and (c) models make possible optimum use of resources according to carefully specified output objectives assuming knowledge of desired output at all levels of operation and awareness of relationships between all resource inputs and all desired outputs. Our college is just beginning to discover and produce the linear functional equations between resource and output. However, we have to address those exogenous qualitative effects since the output of the system says nothing about the quality of our student's education, what value his collegiate experiences are, or what is the "best" course of action.

Figure 1

MANAGEMENT INFORMATION SYSTEM
Yakima Valley College (Proposed)


Facility Analysis Reports
Facility File
MIS–3
HEGIS
Dept./Div.
Equipment File
MIS–8
Equipment Utilization Analysis Reports
HEGIS
Student Characterist. Reports
Student File
MIS–1
Room No.
Student ID
HEGIS
Occupation File
MIS–4
Occup. Program Effort Reports
Line No. and Enrollment
HEGIS
Dept./Div.
Dept./Div.
Dept./Div.
Curriculum Analysis Reports
Course File
MIS–2
HEGIS and Dept./Div.
Finance File
MIS–5
Finance Status Reports
Instructor & Inst.
ID No. Effort
Staff Soc. Sec. No.
Staff Soc. Sec. No.
Prof. Staff Reports
Professional Staff File
MIS–6
Classified Staff File
MIS–7
Class. Staff Reports

Office of Planning and Management Systems

Gary A. Rice

MIS Data Base Structure

Figure 1 shows a computer-based management information system and data base composed of eight distinct but interlocked master file records. Each file produces a series of operating reports that are descriptive in nature. The student file contains biographic/demographic information on each student. Static data such as social security number, name, sex, and ethnic status is established while variable data such as student major, courses taken, G.P.A., etc. is updated as necessary. The Curriculum or course file is the linchpin of the system since the main business of a community college is instruction. Again static data such as department identifier, course number, credit hours, and contact hours are captured but variable information such as instructor, room location, time of day, etc. is updated from term to term.

The third file is Facilities. Every square foot of space controlled by the college is accounted for in terms of P.C.S. organizational unit, HEGIS subject area, function, assignable square feet, replacement cost, etc. It is tied to the Curriculum file by room number which allows room utilization studies to be carried out. The fourth file contains all of the separate Vocational-Technical-Occupational programs sponsored by the college. Since it ties to both Student and Course files both students and each two-year terminal degree program can be more easily monitored.

The Finance file is a regnant component of the MIS. The State Board For Community College Education (SBCCE) has not defined the components of this file, so Yakima Valley College is automating its entire accounting, purchasing, and vendor system with an eye toward total interface with a probable master file. Such things as travel, supplies, equipment, staff benefits and the like will ultimately be budgeted down to the department/discipline level, as well as the capability to allocate and trace federal project funds throughout the college. The maintenance/operation and capital projects budgets will be separate but linked.

The sixth file is a record of the Professional and certified staff. All full-time, part-time, moonlight, paraprofessional and volunteer teaching staff as well as administrative staff are included. Static data during the year such as name, social security number, base salary, and contact days are included but moonlight or part-time assignment, percent of effort in direct instruction, class contact hours and other values are updated each quarter or as necessary. It is linked to the Course file and Finance file via social security number. The Classified staff file includes custodial, secretarial, and all other classified members. Its structure is very similar to the Professional staff file.

The last master file contains every piece of Equipment owned or leased by the college. Besides state tag number, other data items include each item description, model/serial number, date of purchase, unit cost, building and room location, and type of equipment.

As mentioned earlier, each file will provide a series of operating reports. However, visualize a third-dimensional vector coming from any and all file combinations that are shown to be interlocked. These combined-file analytic outputs represent what Sheehan (1972) calls Analytic reports. They represent valuable management information for decision-making.

Cost Accountability Models

Your attention is now directed to figure 2.[1] The previous figure represented primarily a technological task of determining relevant data elements and building appropriate computer files. But, as Sheehan notes, the real difficulty emerges at the third level of Planning and Management System when one has to ask some future-oriented questions and simulate the probable consequences. This figure depicts a comprehensive cost accountable forecasting capability composed of four interfaced components driven off the previously discussed data base with user-defined constraints.

Data from the student and course files produce input to operate the Induced Course Load Matrix (ICLM). This package is composed of the NCHEMS program and a locally-designed supplement that displays the department workload by student intent by student level by course level. The latter also transposes the four-dimensional matrix to show how various student intents array themselves across the curriculum by course level by student level. Finally this user-defined program identifies the various departments and students' intents as cost centers and prepares input for the subsequent NCHEMS RRPM 1.6 module. The cost for operating the program is $17.50.

The Course and Professional Staff files are employed to simultaneously prepare the input for two separate modules according to externally defined user specifications. The NCHEMS Faculty Data Generator (FDG) program identifies each instructor as a cost center and spreads each person's load and salary across departments by course level. It also shows each department in terms of FTE faculty, total direct instruction salary, total student credit hours, class contact hours and student credit hour productivity ratio per FTE faculty member. It too prepares input for RRPM 1.6 and the total cost is about $3.00.

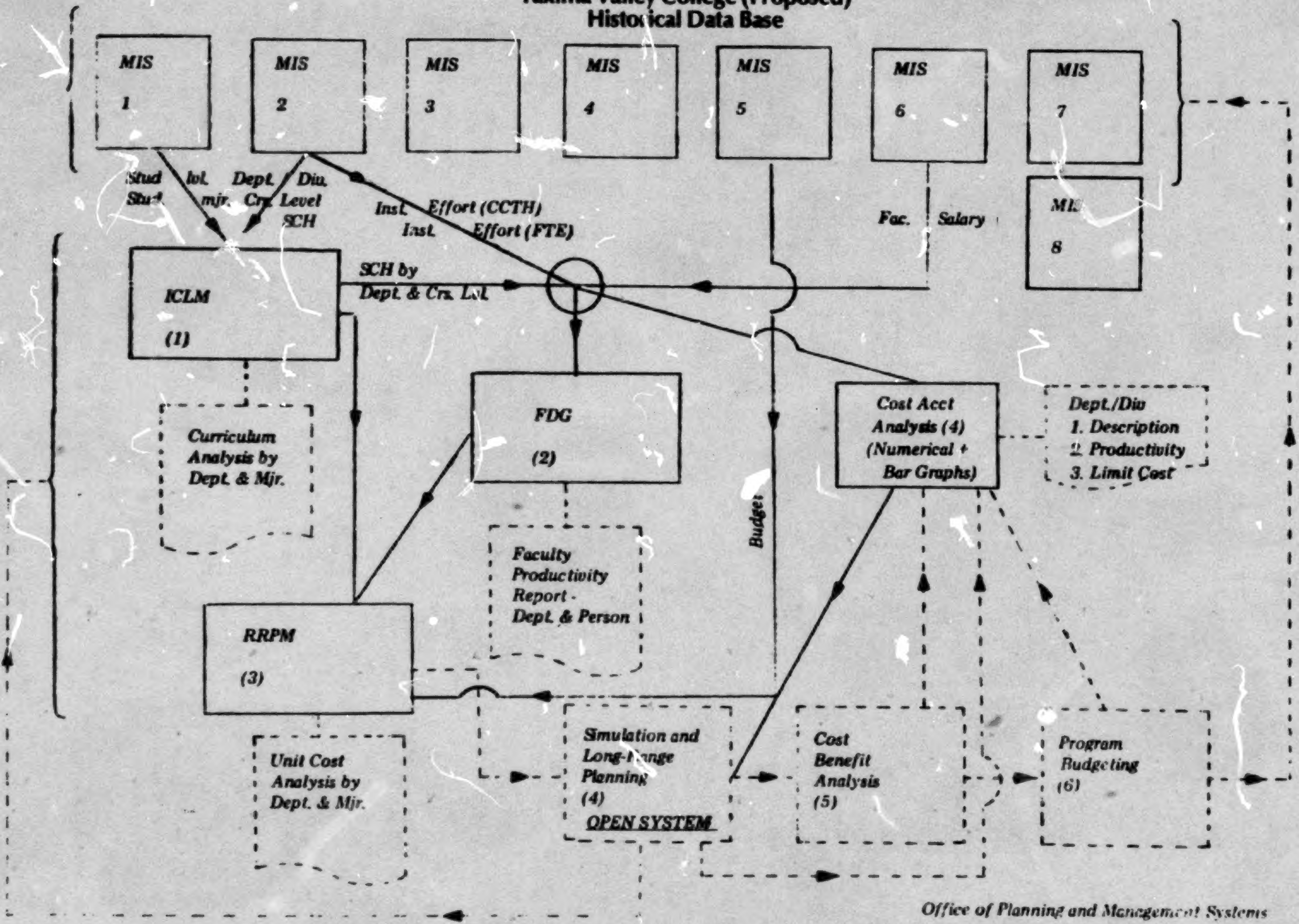
RRPM 1.6 is driven by data from the two previous programs and user-defined input about supplies, travel, secretarial/clerical salaries, equipment, and additional expenditures assigned to each department. The latter are manually defined since the Finance file is not complete. The Resource Requirement Prediction Model shows total and unit cost per FTE student by department, division and college. It also has a module that computes unit cost per FTE student by student intent. Finally it has a module that allows the college to include all other instructional support expenditures to obtain a total college picture. To date Yakima Valley College is loading these values as constants until the opportunity to conduct the necessary multiple regression analyses to determine appropriate weighted equations for each support category presents itself. The cost for this program is $11.00.

Although the closed system just described has presented a post hoc picture, it is possible to "unhook" the model from the data base and open the system to include information from such things as needs assessments, faculty activity analyses, constraints from external agencies, job market conditions, and special interests. Then one could pose some hypothetical "what if" future questions and use the model in a simulation mode. However, before proceeding along this line I would like to digress a moment and call attention to the model designed to augment, supplement, or even supplant all of the information previously supplied by ICLM, FDG, and RRPM 1.6. It is driven off input identical to FDG with the addition of credit hours, enrollment and course line number identifier for every course. An example of the output information is shown in figure 3.[2]

As you can see this model provides a fairly complete profile of each department. Such descriptive indicators as total headcount enrollment, student FTEs generated, full- and part-time faculty FTEs required to serve their students, student

Figure 2

COST ACCOUNTING ANALYSIS SYSTEM
Yakima Valley College (Proposed)
Historical Data Base


MIS 1
MIS 2
MIS 3
MIS 4
MIS 5
MIS 6
MIS 7
MIS 8
Stud Stud
Iol. mjr.
Dept. Crs.
Div. Level SCH
Inst. Effort (CCTH)
Inst. Effort (FTE)
Fac.
Salary
ICLM (1)
SCH by Dept. & Crs. Lvl.
FDG (2)
Cost Acct Analysis (4) (Numerical + Bar Graphs)
Dept./Div
1. Description
2. Productivity
3. Limit Cost
Curriculum Analysis by Dept. & Mjr.
Faculty Productivity Report - Dept. & Person
Budget
RRPM (3)
Unit Cost Analysis by Dept. & Mjr.
Simulation and Long-Range Planning (4)
OPEN SYSTEM
Cost Benefit Analysis (5)
Program Budgeting (6)

Office of Planning and Management Systems

Gary A. Rice

credit hours, weekly class contact hours, and student contact hours are calculated. Additionally the relative percentage contribution of each value to the division and college is determined. Second, productivity indices per FTE faculty member on each of those values are produced. Third, total direct full- and part-time instruction salary and average salary per FTE faculty are determined. Fourth, a series of unit cost values are calculated including headcount, student FTE, student credit hour, weekly student contact hour, weekly class contact hour, and direct cost per hour of instruction. Finally, the computer separately scales and bar-graphs each of the values in departmental (divisional) ascending order. The program has been written to allow a user to add, delete, or modify an individual course or instructor or department or division. The user can include expenditures for supplies, travel, equipment, secretarial costs, staff benefits, and miscellaneous additional costs. These are cited in the appropriate department, added to direct instructional salaries, and aggregated to the divisional and college levels. Also the user can request the entire output of an individual department or any single component in figure 3 in either numeric or bar-graph form. The program is designed to array the same information by individual instructor instead of department. One can convert information from a Faculty Activity Analysis into weekly class contact hours (CCTH) and include it as part of the instructor's workload. It can also aggregate quarters/semesters to produce annual or biannual composite department/instructor profiles. The cost is approximately $2.00-$7.00 per run. Thus the locally created program can be used to simulate various alternative solutions until one appears to be appropriate. Then it can be submitted through the other three-program sequence to produce a more comprehensive impact picture. At this point college decision-makers must secure information about benefits accrued for their investment and conduct a cost benefit analysis. This can also be simulated as the users become more sophisticated in asking the right kinds of questions in the right way. Then, once a decision has been made and any action taken, it must be entered in the data base and resimulated since the model itself has now become part of the historical data.

The creation of this comprehensive MIS system required an identification and definition of major input and output variables which merited the cost of collection, storage, and potential retrieval. The input variables are usually represented as dollars. Because social and philosophical definitions of output are currently so elusive to quantify, it was necessary to begin by stating them as endogenous proxy or surrogate terms like student credit hours, contact hours, etc., which are controllable through policy decision, quantifiable, and presumed to approximate the former. This task was crucial because an inclusion of irrelevant variables or exclusion of relevant variables would break the system's closure. A particularly difficult task was to trace and define our college organizational structure and processes which transformed input into output. In order to incorporate the policy-making interrelationship/procedures into the system, it was necessary to provide for the formal chain of command and the informal arrangements as well. The latter was extremely difficult to quantify.

Figure 3

DEPARTMENT PROFILE

Department:	Code:	Term/Yr.	
I. *Description*	Total	% Div.	% Col.
1. Headcount			
1A Freshmen			
1B Sophomores			
2. Student FTE			
3. F-T Faculty Effort (Head)			
4. P-T Faculty Effort (Head)			
5. F-T Faculty Direct Inst. Effort			
6. P-T Faculty Direct Inst. Effort			
7. Courses offered (sections)			
8. Student Credit Hours-SCH			
9. Weekly Class Contact Hours-CCTH			
10. Weekly Student Contact Hours-SCTH			
11. Direct Instructional Salaries			$
11A F-T Fac. Dir. Salary			$
11B P-T Fac. Dir. Salary			$
12. Total Dept. Cost (Direct & Support)			$
II. *Productivity Ratios* (per FTE Faculty)			
1. Headcount Enrollment			
2. SCH			
3. CCTH			
4. SCTH			
5. Student FTE			
III. *Averages*			
1. Section Size			
2. Faculty Salary-FSAL			
IV. *Unit Costs* (per FTE Faculty)			
1. Student (headcount)			$
2. SCH			$
3. CCTH (weekly)			$
4. SCTH (weekly)			$
5. Student FTE			$
6. CCTH per hour Instruction			$
7. SCTH per hour Instruction			$
V. *Support Costs*			
1. Secretarial/Clerical			$
2. Supplies			$
3. Travel			$
4. Equipment			$
5. Staff Benefits			$
6. Additional			$

College Planning Group and Their Tasks

In an attempt to prepare the various elements of the college to begin to view themselves in a new and more empirical fashion, the president and research officer selected a 12 member, blue ribbon presidential planning advisory group. The membership contained representatives from each existing division, AFT, AHE, Dean of Instruction, administration, student personnel, and minorities. The students, staff, and board were to become subsequently involved through "Position Papers" which they would study and respond to. The group was given complete access to any institutional data they requested. They were then charged to become a knowledgeable resource body to (a) simulate alternative action courses for various problems, and (b) present documented recommendations to the president. The president made a written commitment to give serious consideration to the position papers prepared by the group and be answerable to them for decisions made contrary to their recommendations. As the group members became more familiar with the process and output, they would serve as a vehicle to disseminate their understanding to the campus. Initial tasks included the development of a spirit of mutual respect and trust, professional candor, and other capability to divorce themselves from defensive parochial interests to a concern for the direction of the entire institution. They also had to be instructed in the current language and interpretation of accountability measures. A difficult task for them to master was breaking away from "quill pen" concepts of assessing the college and becoming aware of the computer's power to simultaneously accommodate the myriad variables exerting their influence. Also moving the college decision-making process from a crisis-reactive posture to an anticipatory-planning mode is a slow process but it is occurring as better, more empirical, and relevant information becomes available.

The group had to become accustomed to observing the college's resource requirements arrayed in a program budget/PCS format rather than the way they typically conceived the curriculum to be. Also the models, at this stage of utilization, serve best as long-term trend indicators rather than as a budget model, but the members tended to initially use the output in the latter rather than former mode. The models are hypersensitive to enrollment fluctuations and they had to adjust to the fact that an increase in headcount automatically increases the projected number of faculty whether or not that may be possible for an institution facing the budget crunch. Along this same line, the models project on a unit cost basis so they tend to overestimate projected costs of established programs which would be changed in terms of marginal costs. It costs less to add or subtract 10 persons from an existing program than to start a program with 10 students. They had to account for the fact that the models did not effectively deal with inflation costs for goods and services. If enrollments were projected to stabilize, the projected costs would also appear to remain constant when, in fact, they would be rising.

The group had to learn not only how to interpret the computer results, but also how to ask the right questions in the right way. For example, there most common "backward" question from the model viewpoint is, "What can we remove or reduce to save $50,000 in next year's operating budget?" A reduction like this could only be found by chance since it is conceptually backward for the models to start with a specified cost answer and work back to the input parameters. Finally they had to accept the fact that these models were only tools to aid in decision-making, not decision-makers themselves. The returns in no way indicated benefits to accrue from any cost alternative. A particular decision tested by the models may save large dollars but destroy a program, or a high cost alternative may be of sufficient benefit to maintain its existence. Also a model simulation does not purport to predict the future per se, but only explicitly indicates the nature of the process by which the future evolves out of the past and present.

Initially the group asked the management systems officer to lead them through the process and they would approach their assignment as an open-minded sounding board. They decided to utilize the model to establish an historical baseline and look for "developmental" rather than "process" laws to construct an underlying theoretical structure applicable to the community college. Thus, they were wary of initial predictions. As their knowledge and sophistication increased they would gradually assume leadership and direction, although the ultimate decision-making remained vested in those duly assigned such responsibility and authority.

The first substantive effort of the group was to obtain a comprehensive overview of a particular instructional term. This included numeric output from both accountability models and the preparation of statistical charts to graphically display the picture. At this point generalized overview presentations were made to the Board of Trustees, staff, and student representatives to acquaint them with the potential of these tools for decision-making, policy-formation, and accountability to the community. A concurrent purpose was to allay fears that this system was club to bludgeon faculty. The second major task was to array the college according to categories defined by SBCCE, determine patterns of strengths and weaknesses, and ascertain how the model would represent the college in the state funding allocation formula.

Looking at the college from both perspectives pointed up the fact that neither seemed to provide a very meaningful picture of the extent to which a community college was meeting its mission, goals, and objectives as stated in the Washington State Community College Act of 1967. In an attempt to address this problem and give the college more flexibility to assign scarce resources for maximum utilization, the following accountability baseline matrix was presented to the group. They are currently giving it serious consideration and simulation study prior to the preparation of a topical position paper.

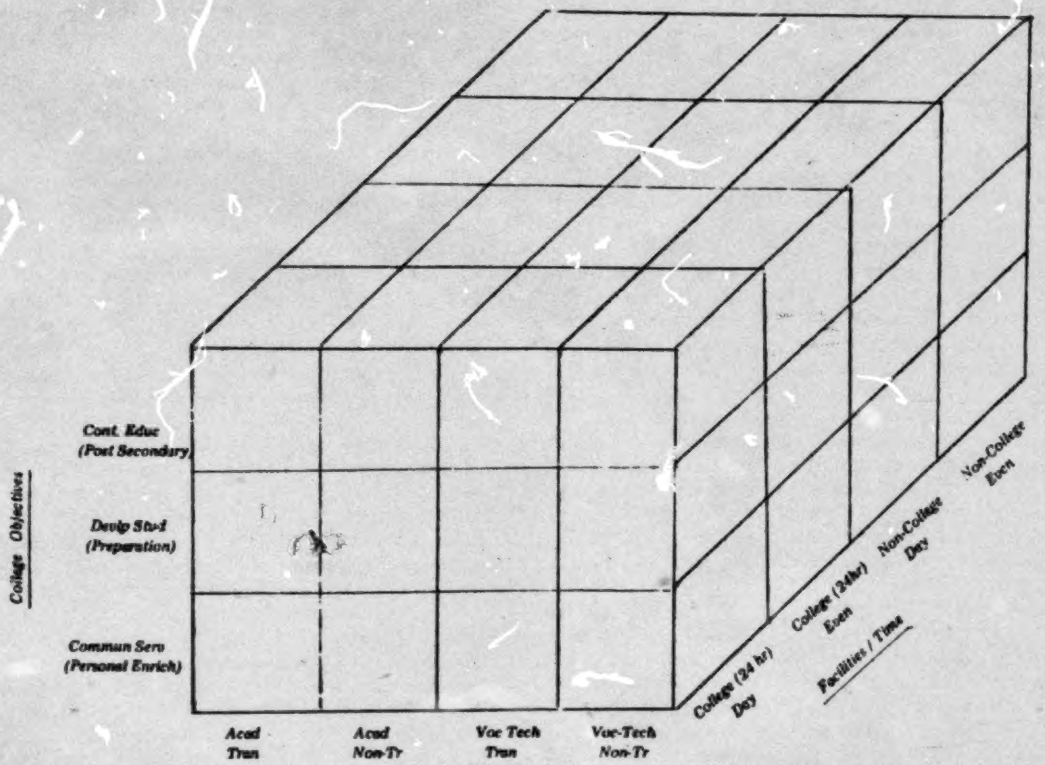
Objectives Accountability Matrix

The three x four x four matrix encompasses the stated goals and objectives of the college as stated in SBCCE publications, Community College Act, and college accreditation report. The three main college objectives are to (a) provide Community Service/personal enrichment offerings, (b) Developmental or preparation activities such as basic skill development, etc., and (c) Continuing (Adult) Education that is postsecondary in nature. These objectives can be met by academic transfer, academic nontransfer, vocational-technical transfer, or nontransfer offerings. Finally these courses, activities, or programs can be offered during the day or evening in either college-controlled or non-controlled facilities throughout the college district. Although the cells are mutually exclusive, it is possible for a given course to exist simultaneously in several cells. For example, Introductory Psychology 101-1 could be continuing education, academic transfer, on-facility day while Psychology 101-2 would be continuing education, academic transfer, off-facility evening. Each cell could be treated as a department/discipline and the three rows treated as divisions. When inserted into the model the output shown in figure 3 could be determined for each cell.

The college arrays the current offerings within such a matrix which discloses the current weighting given to each cell whether by design or accident. Some cells appropriately made zero contribution. At this point the college makes decisions about the priority weightings to be assigned to each of the cells, determines needed activities and their historical costs, and prepares a curriculum template. Resources can be allocated to each cell according to percentage contribution with appropriate formula weightings for type of activities needed to meet the cell objective. A visible contingency fund for innovation within each cell can be included. The current departmental and divisional offerings can be arrayed in matrix format and overlaid on the college picture to determine excesses and shortages. When setting up the curricular offerings for a given term the Dean of Instruction, division chairpersons, and departmental heads can determine in which cells to place each course or activity in terms of the primary institutional function it serves. The courses are then funded out of the dollars assigned to the cell, rather than moving funds to accommodate the existing course structure. Such a matrix would play a major role when

Figure 4

CURRICULUM ACCOUNTABILITY STRUCTURE
(By Dept, Div, and College)


Cont. Educ (Post Secondary)
Devlp Stud (Preparation)
Commun Serv (Personal Enrich)
College Objectives
Acad Tran
Acad Non-Tr
Voc Tech Tran
Voc-Tech Non-Tr
Types of Offerings
College (24 hr) Day
College (24hr) Even
Non-College Day
Non-College Even
Facilities / Time

Office Planning and Management Systems

courses are added, deleted or revised. Thus, it provides the college administration and staff with a capability to assign staff, facilities, dollars and effort to the points where they are most needed without violating tenure, academic freedom, discipline integrity, instructor specialties, etc. Given constraints of tenured staff, fixed facilities, etc., a decision to allot limited resources to one cell would necessitate a decision to lower another cell's priority. Once various assessible measures of "success" have been negotiated between the college and the community, they can be compared against these expenditures. This implication of educational goals and management as negotiable is observable as a national trend. Each student intent classification could be spread across the matrix via the ICLM to compare student goals with institutional goals. It also seems that a concurrent objectives matrix could be applicable to delineate the contributions of instructional support areas such as administration, student personnel services, library, physical plant, etc., and interfaced with the curriculum matrix to provide a total cost picture. It even provides the structure for a college to take the initiative in tailoring and defining what they do as well as how they wish to be held accountable. Instead of having goals and objectives defined by legislative mandate or state commission decree, the college can take a documented case to them. Differences will then be based only on how the objectives were defined, not upon how well resources are allocated toward those goals.

Accrued Benefits

The system as it has evolved to this point has produced several benefits. Establishing the eight master records has created an integrated framework for the institution's record-keeping and management information. This renovation process has developed several reports which have fallen out of the data organization process and have important imbedded management information. Second, it has greatly simplified compliance with numerous requests for information by SBCCE and other external agencies. Third, the old adage "If you don't know where you are going, any road will get you there" has been true to some degree in the past, but access to a new empirical and non-traditional view provides insight for more relevant long-range planning. It has also enabled our college to approach funding agencies with new confidence. Finally, the system and models have become excellent communication devices within the college for negotiations, curriculum planning, etc. Currently the model is being used primarily to substantiate the wisdom of an intended action course, although there are signs that familiarity is producing more staff use as future-oriented simulation planning.

It is my hope that this presentation will serve as a stimulus to solicit constructive comments from colleagues at this Forum and others engaged in similar endeavors. Sharing experiences, techniques and strategies can save much wasted energy, time, personnel, dollars, and effort.

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[1] The planning group is studying the feasibility of implementing the NCHEMS-IEP process. If adopted, their software modules would be linked with the operational models depicted in this figure. It also appears that the matrix proposed in Figure 4 would accept IEP definitions and structure quite conveniently.

[2] The Washington State University computer installation accessed remotely was an IBM 360/67 Release 21.7. One run required on the average 120K, 3 discs, 2 minutes CPU time, 10 minutes elapsed time, and produced 8K lines of output for a complete curriculum profile.

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IDENTIFYING COMMUNITY IN COMMUNITY COLLEGE

Joseph Rossmeier, Northern Virginia Community College
Mantha Vlahos, Broward Community College
Gary A. Rice, Yakima Valley College

The current trend from class to mass learning greatly enhances the real purpose of community colleges. In a very simple definition, community college means opening access to higher education to all the people living in a particular district, city, service area, etc. Whether the college serves an urban, suburban, or rural setting, similarities exist in the need for first understanding the community, its groups, its people, their organizations, and their institutions, and then offering educational opportunities, both for production and for consumption (Birenbaum, 1974, p.5).[1]

Community colleges have, as one of their five legally charged functions, the responsibility to create comprehensive programs and services which are equally accessible to all citizens residing within their defined district. Providing such a community services program traditionally means activities for a normal progression through the system. Also, most approaches to "outreach" have followed the pattern of "extending the campus" through exportation of existing courses traditionally taught by circuit riders from the central campus or locally employed persons. Most such programs have grown out of locally expressed needs of limited groups or mailout interest surveys. Despite warnings by Verner (1960) that such programs need to be based upon (a) a solid foundation of citizen participation and college-community interactions, and (b) a thorough understanding of the specific community to be served, most community colleges skip the essential first step of conducting a comprehensive community survey.

Harlacher (1965, p.15) contends that implementation of a program of community oriented educational services requires a departure from the campus concept of college and the acceptance of several fundamental principles:

1. In a community college the campus is the length and breadth of the junior college district.
2. The intention of a program of community educational services is to bring the community to the college and to take a comprehensive college program out into the total service district.
3. The educational functions performed by the college must not be limited to formalized classroom instruction.
4. An essential function performed by the community college is to serve as a catalyst in community development and self improvement.
5. The program of community educational service sponsored by the junior college serves to extend the resources available to the community and does not replicate existing services.

Various aspects of the modern community college involve issues to which institutional research should address itself. Among the factors to be considered are the organizational structure, physical structure, communication with faculty, staff, students, the community, and the state, and a management information system accountability structure.

Organizational Structure

In the metropolitan community college organizational structures are varied. Numerous modes of learning networks are established throughout the college structure. A crucial issue for institutional research is investigation of whether the organizational structure existent at a college is conducive to the achievements of the goals and objectives of that college. The original structure should reflect the college's short- and long-range goals.

With a multi-campus approach to learning, decisions must be made concerning the degree of autonomy which each of the campuses or college centers should have. An area of much concern is whether college administrators should operate from a central base or whether there is decentralization of authority. Each multi-campus unit should enjoy a certain degree of autonomy, especially in the areas of curricular and instructional concerns. However, the community will be best served when the policies and procedures are coordinated throughout the college service area.

The community or the area which the community college serves should be the central focus in the determination of the college's goals and objectives. The ultimate purpose for these goals and objectives is to serve the educational needs of the people in the service area. As the community college extends itself beyond the barriers of the college walls, it must develop its internal organizational structure to give the maximum flexibility possible in dealing with the issues within its community.

Physical Structure

The physical environment of the area in which the college is located is a major determinent of the physical structure of the college. The population in the service area, number of square miles, amount of in-and-out migration, and characteristics of the community (racial and ethnic demographics, age groups, types of industries, physical location, and travel arteries) must be identified before an adequate physical structure to meet the needs of the community can be issued. One approach to utilize physical facilities within the community is to make use of various store-front locations. These so-called "kleenex colleges," a phrase coined by Knoell and McIntyre (1974, p.96) to depict the disposable quality of storefront locations, include such facilities as numerous businesses and industries, military bases, prisons and reformatories, private colleges, elementary and secondary schools, churches, hospitals mental health centers, retirement centers, shopping centers, and apartment complexes. In addition to the storefront locations, the learning network represented by varied educational services can be expanded with the intent of increasing the options for learning. These options must exist in a society in which lifelong learning or learning for life is a necessity for many and a delight for some. Two experimental examples which use existing community communication networks to expand educational options include (a) an Extended Learning Institute which operates through a mix of television, film, and audio printed materials, and (b) computer assisted instruction in the form of TICCIT (Time-shared, interactive, computer-controlled information television). While these two innovative approaches are still in their infancy, they are exciting because they rely heavily on modern media which has the potential to stimulate mass learning systems. Possibly, these experiments could have a profound impact on the development of packaging modules for learning in more effective ways. These techniques are interactive and, as far as possible, self-operating in that they provide a highly individualized approach to learning in free time and in free space.

Communication with the Community and State

In order to analyze the service population, communication with the community is imperative to determine what data already exist. In the metropolitan areas, there are numerous agencies which collect data on a regular basis. Among these are the social service agencies, community planning groups, Chambers of Commerce, employment service, research departments of utilities, etc. (Even places such as condominium associations and land developers have a wealth of information concerning the community). The community college researcher should also not overlook research efforts of nearby educational institutions. Universities have very well developed research departments which usually maintain information on all areas within the state. Likewise, county school boards and intermediate districts maintain pertinent information on the community and the students. To identify the community each one of these existing sources should be tapped. The researcher should identify the agencies, contact key persons, and determine dates when the information is periodically updated. Mailing lists can be developed and maintained after initial personal contact.

A community college faces several difficulties in its attempts to establish bilateral communication with persons in its service area. First, any geographical barrier can prove to be significant in establishing a college image and a presence away from the main campus. The vast majority of two-year college students commute to the college for short periods during the day and return to home or work, so they do not establish much identity with the college. Second, ethnic groups have voiced concern that their needs have not been heard or addressed. Third, there are often long-standing community rivalries about where the college off-campus centers and offerings should be located throughout the district. Although they are legally defined as cooperating groups, in actuality they are likely to be fiercely competitive and actually antagonistic. This acrimony is quite counterproductive to the creation of effective community service programs. Fourth, students from the remote corners of the district face the limited alternatives of (a) moving to live in the college facilities or local housing, (b) commuting long distances under bad road conditions during the winter, or (c) forgetting about postsecondary education. Fifth, the political climate of the community college service area plays a major role in the determination of college-community relations.

While the college is busily attempting to accommodate the needs of local students, it has an obligation to operate within the guidelines of a state-wide community college system. As with most state-level bureaucracies, occasions arise when "red tape" complicates response to local needs. At this point the college has to devise an ongoing mechanism to assess community needs and relay such needs to the state. Feedback to the state is essential in maintaining a broad perspective of changing conditions. However, caution must be exercised that when the state coordinating agencies determine what information they require to present to the legislature they do not destroy local control. Constraints imposed by state system mission and goals or reporting procedures can thwart many potential students. Making sure that the state has the correct picture of the college operation and the barriers to be overcome represents one of the most crucial issues facing community college researchers.

Accountability Structure

The first step toward community involvement and participation would be a needs analyses throughout the service area using both local and grant monies. Special interest groups should be contacted. Open public hearings provide opportunities for catharsis and validated needs emerge. Attempts to fulfill these needs are then made and the Board of Trustees and college officials make frequent reference to the results of the studies for policy and operating decisions. The community, through various advisory groups, is continually apprised of efforts toward these ends. Additionally, the college attempts to employ citizens in each community to keep its fingers on its pulse and assist in formulating needed community service programs. Subsequent follow-up to determine the success of college endeavors keeps the system open for continual input and feedback from its constituents.

A community college in Washington State is currently operationalizing its entire operation in a concerted effort to obtain relevant, timely, and accurate information about community needs. They have constructed and interfaced 8 master computer files. To this interlocked data base, computer simulation models including RRPM 1.6, NCHEMS-IEP software, and a locally designed model have been designed and are being implemented. A presidentially-appointed college planning advisory group has been coming to grips with goals/objectives cost analysis and productivity measures and preparing position papers regarding future directives. Currently they are studying and simulating a baseline accountability matrix which would allow the assignment of resources toward stated mission, goals, and objectives rather than in a department/discipline structure. This would enable the college to become much more accountable to the communities it serves, state coordinating agencies, and the legislature.

It should be noted, however, that the creation and implementation of a computer-based system represents a beginning of a community accountability structure. Educating the various clienteles, i.e., trustees, administration, faculty, students, and community, to view the college existence and operation from a common, empirically-based reference point becomes a first task. Concurrently one must overcome fears of "time-and-motion," "chicken-entrails analyzer," "handy-dandy instant answer to all problems," etc. to utilize the information as a tool rather than a club. Second, attempts now need to be made to incorporate additional variables influencing cost and productivity such as needs assessment information, faculty activity analyses, economic characteristics of service area, support costs, etc. Third, community college professionals must take the lead in assisting the community, legislature, courts, and others to define those criteria by which they will be held accountable. Surely others will define such things for them if they do not do so. Finally, the community college staff needs to (a) reach out to its constituents, (b) determine their valid needs, (c) ascertain resources required to serve these needs via simulation, (d) present one's documented case to funding agencies, (e) carry out programs/activities calculated to reach specified and consensus assessable objectives, (f) follow-up after an appropriate time frame, and (g) relate accomplishment back to expended resources.

Several other accountability measures can also be employed by the community colleges. First, each college could adopt a Management by Objectives approach to decision-making. Second, each college could assist in the development of a state Master Plan for Research. This plan would call for all colleges to evaluate their past activities; monitor current programs, procedures, and policies; model and assess furture possibilities; and analyze quantitatively and qualitatively information about all aspects of the educational environment. The assumption here is that only to the degree that analysis, research, assessment, and planning in all facets of institutional activity become a reality, can a community college really show responsibility to its public.

In summary the notion of a comprehensive community college should be modified to read *comprehensive community college education*. Rather than planning around the traditional campus, future efforts need to be directed toward a community-college interface. The college must come to be viewed less as an institution apart from the people and more as an integral part of individual and group lifelong life styles. The wall between the college and the people it serves must be broken. In the words of Robert Frost, "Before I built a wall I'd ask to know what I was walling in or walling out."

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[1] Education for *production* prepares people to make a living. Education for *consumption* focuses upon knowledge for life itself. (Birenbaum, 1974)

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GROUP INTERACTION USED TO ACHIEVE THE DESIRED OUTCOME IN A COMPETENCY-BASED COURSE

Nathan R. Keith, Jr. and David E. Suddick
Governors State University

The primary role of those in institutional research is not direct instruction; rather, a major function is eliciting information concerning the educative process. The intent of this manuscript is to present a testing-learning process that, when applied in the classroom, should result in increased learning. Thus, the application of this innovative technique, as well as others, may affect the traditional measures of success in higher education; that is, grade point average and retention statistics.

Governors State University is committed to experimenting with nontraditional and innovative modes of instruction. Consequently, the testing-learning experiment detailed herein is an attempt to affect the instruction of a student body whose uncommon demographic characteristics are 40% racial minorities and 100% non-residential commuting students while having a mean age of 32 years.

Theoretical Tenets

Beeson (1973) argued effectively from research for the necessity for change in conventional testing techniques in the classroom. The model for this experiment is not the direct application of the known work of others; rather, it is eclectic. The major tenets are as follows:

1. Greater control and maintenance upon the advantages of instructional refinements must be affected for the maximal capitalization of the technique (Sullivan, Baker, & Schutz, 1967).
2. Peer interaction in the classroom is essential (Piaget, 1964).
3. Highly motivated students exhibit the greatest vigor in their pursuit of learning tasks when the probability of success is about 50% (Atkinson, 1964).
4. When the experimenter controls knowledge of results to indicate that the learner's performance is inadequate, the student increases his effort to cope with the task (Thompson & Hunnicutt, 1944).
5. Individualized instruction can be improved by providing each student in a group with diagnostic feedback about his learning (Bloom, 1971; Bloom, Hastings, & Madans, 1971).
6. The reinforcement schedule can be set to meet the constraints of the experiment since no evidence has been found that supports the contention that smaller increments are superior to larger increments (Sullivan, Schutz & Baker, 1971).

Subjects

The subjects were 54 masters candidates in the College of Human Learning and Development who were primarily teachers in kindergarten through twelfth grade. Their reasons for earning an advanced degree were primarily to meet certification requirements and to receive salary schedule increments. Thus, the assumption is made that the subjects were motivated both professionally and monetarily. Furthermore, the subjects were similar to the general demographic characteristic of the GSU student body.

Methodology

The experimental procedure was conducted twice during the July-August 1974 eight-week session at the mid-term and final examinations, respectively. The general procedure was to administer a 30-item multiple choice examination having 4 options during the first 45 minutes of the 3-hour class meeting. The class was then dismissed and reconvened in 15 minutes. During the interim, the examinations were scored and then ranked from highest to lowest. Using the randomized block procedure, the examinations were systematically distributed into seven equivalent groups each having a sampling of the highest through the lowest scores.

When the class reassembled, the knowledge of results by individual student was not communicated. Rather, the class was told that few individuals met the competencies, but most were close to realizing the criterion. The class was then separated into small groups with their charge being to determine the rationale for the appropriateness of the responses to each item. The groups were left to their own discretion for the task with the time limit being 45 minutes.

At the mid-term the same examination was administered after the group discussions. Furthermore, the group was retested one week later again with the same instruments, but were not informed that the second retest would transpire. The procedure, however, was changed at the final examination. The retest was with a parallel form and for obvious reasons the group was not given a second retest as the final examination was held on the last scheduled class meeting.

A total of 54 students participated in the mid-term experiment with 7 groups being formed; 5 were composed of 8 members, and 2 had group membership of 7. At the final experiment, 50 students participated. Again, seven groups were formed; the size of one group was eight, and the membership of the remaining six groups was seven. During all group discussions, the two instructors observed the interaction of the members and concluded that all tenets were met and that students were learning from each other.

Statistical Treatment

Analysis of variance (ANOVA) was used to test for significant differences for scores of each testing. The interaction term, groups by testing, was investigated first and then the main effects of testings and group membership. The alpha level was set at .001.

Limitations

The design was quasi-experimental in nature since in both testings there was no control group. (Campbell & Stanley, 1963). However, the purpose of the testing-learning experience was to assist the students in meeting the competencies, not to meet the constraint of an experiment. The mid-term testing was conducted with only one form of the instrument, but was augmented by a second retesting one week later.

Results

Analysis of the test-retest results for the mid-session showed a dramatic increase in the scores for each of the seven groups. The mean scores of the 7 groups for the first test of the mid-session ranged from 17.88 to 19.57 with a class average of 18.65. Group results for the retest ranged from the lowest group mean score of 24.25 to the highest group mean of 27.62. The total group mean for the retest, following group interaction via discussion, was 24.92. The specified level of achievement of at least 80% correct (24 items) on the mid-session examination was realized by only 4 of 54 students on the first testing. After a group-interaction session in which a logical determination of the correct response for each item was determined, the retest was given. A total of 44 students met the stated level of competency as designated by the coordinators of the module. This indicates a marked increase 7.4% achieving the expected level of competency on the first test to 81.5% reaching the acceptable competency level on the retest immediately following the group interactions.

The follow-up testing one week after the mid-session met with similar results as the retest following group interaction. There was no significant difference between groups when the retest scores and the test scores one week later were compared. The scores ranged from a low of 22.70 to a high of 26.90 with a class mean of 24.98. A total of 79.6% of the class achieved the desired level of competencies on the follow-up testing one week later.

A two-way analysis of variance yielded significance for the main effect of testing at the .001 level of significance, but non-significant main effects for groups or interaction effect at this level. The mean scores by group for each testing and the analysis of variance results are presented in Table 1.

Comparing the results of the test-retest on the final exam yields similar findings. This is particularly encouraging since the retest was a parallel of the form used prior to group discussion. Once again there was a significant difference for the main effect of testing as indicated, but there was no significant difference for the main effect of groups, and there was no significant interaction between main effects. The mean scores for groups and testings on the final exam and the ANOVA are presented in Table 2. At the first testing the mean correct for the total was 16.24 with range of group means being 15.75 to 16.57. On the parallel form after group interaction, the range of scores for the groups was 20.86 to 23.28 with the total mean equal to 22.00.

At the final examination, the instrument used demanded more expertise on the part of the testees than at the mid-term examination. Thus, the level of competence was set at 67%, not 80%. Only 9 out of 50 subjects met the minimum criterion after the first testing, but 37 met the competency at the retest using a parallel form with the benefit of group interaction. This represents a total of 74% of the class meeting the level after peer assistance with only 18% meeting the standard prior to the treatment.

Table 1

DESCRIPTIVE AND INFERENTIAL STATISTICS FOR THE MID-SESSION EXAMINATIONS

		Mean Scores at Testing****		
GROUP	N	1*	2**	3***
1	8	18.75	24.25	25.00
2	8	18.75	27.62	26.90
3	8	18.38	26.25	24.00
4	8	18.25	24.25	25.10
5	8	17.88	22.88	24.50
6	7	19.00	25.00	24.80
7	7	19.57	24.14	22.70
TOTAL	54	18.65	24.92	24.90

* First testing
** First retest after group discussion
*** Second retest after one week
**** ANOVA results:
Testings; F = 88.36, *dfs* of 2 and 141, p <.001
Groups; F = 2.11, *dfs* of 6 and 141, p >.001
Interaction; F = 2.81, *dfs* of 12 and 141, p >.001

Table 2

DESCRIPTIVE AND INFERENTIAL STATISTICS FOR THE FINAL EXAMINATION

		Mean Scores at Testing***	
GROUP	N	1*	2**
1	8	15.75	21.25
2	7	16.29	22.29
3	7	16.43	20.86
4	7	16.14	23.14
5	7	16.43	23.28
6	7	16.14	22.43
7	7	16.57	22.43
TOTAL	50	16.24	22.00

* First testing
** Retest after group discussion
*** ANOVA results:
Testings; F = 15.12, *dfs* = 1 and 86, p <.001
Groups; F = 3.72, *dfs* = 6 and 86, p >.001
Interactions; F = 1.17, *dfs* = 6 and 86, p >.001

Conclusion

The results of this rather simple quasi-experimental situation indicate that group interaction can be used effectively to help students-learners achieve a desired level of competence in a content-oriented course. These findings, however, are tempered with the fact that the experimental design level did not include a control group. With the encouraging results, it is hypothesized that similar findings would be evident in any experiment conducted with a pure experimental design. Furthermore, the procedures cited in this paper are directly applicable for use in any institution of higher education.

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EVALUATION OF ONE TYPE OF NON-TRADITIONAL PROGRAM IN HIGHER EDUCATION

L. La Mar Adams, Leland H. Campbell, Ray Alvord, and John Seggar
Brigham Young University

Boocock (1972) observed that the conventional structure of modern education is not conducive to learning processes. University students and instructors have experienced a growing awareness that the modern curriculum tends to be a straitjacket which retards student and faculty development (Staley, 1969). Tesconi (1972) argued that the "homogenization imperative" of a factory system of education "trivializes man, (and) leads to impersonality in the school. . ." (p.157).

Discontent in modern education has influenced the rapidly growing use of wilderness-type curricula to help remedy problems found in modern educational programs. Several wilderness-type programs presently exist at various universities, as evident in Shuff and Shuff (1972) and Barcus and Bergeson (1972). Wilderness-type programs have been used to help in the development of zeal, motivation, determination, self actualization, and other such attributes which have been considered to be major determinants of academic success in higher education. The Monthly Newsletter by the Royal Bank of Canada (1974) stated: "Charles Darwin held the opinion as the result of a lifetime of critical observation, that men differ less in capacity than in zeal and determination to utilize the powers they have."

Educators have theorized that improved attributes of self concept can improve the academic success of students. Research is needed to determine the extent to which the wilderness-type program can be adapted to generate improvement in these attributes of self concept and the extent to which these attributes influence academic success.

Use of Wilderness-type Programs

Evaluating success of nontraditional programs is a major problem. Evaluation results of various types of nontraditional programs have been somewhat equivocal because of their evaluation methodologies. Foulds (1971), Clifford (1967) and Adams (1969) reported significant changes in self concept. The changes, however, varied from study to study. Treppa and Fricke (1972) and the counseling center staff of the University of Massachusetts (1972) reported no significant differences in measured out-comes for group experiences.

Variations in results of various studies are attributable to variations in the purposes of the studies. Grossman (1967) and Maynard (1969) used wilderness training programs to help juvenile delinquents. A number of programs have been used to improve the academic performance of potential "dropout" students as reported by Berry (1966), Lingo (1906) and Moses and Peterson (1970).

Barcus and Bergeson (1972) and Stimpson and Pedersen (1970) emphasized the need to determine the permanence of self-concept changes resulting from wilderness training programs. Previous studies have lacked the longitudinal research to examine permanency. Another methodological problem in most of the previous studies is lack of a control group. Barcus and Bergeson (1972) stated in review that "only one study (Moses & Pedersen, 1970) used a comparison with a control group." Other problems found in previous studies include extremely small sample sizes and problems of statistical procedures, such as the use of multiple t-tests. These concerns were considered in designing the present study.

Research Objectives

The research purpose was fourfold. The first purpose was to evaluate the accomplishments in terms of the objectives of nontraditional programs in higher education; send, to evaluate the achievement of participants and their reactions to the program; third, to ascertain the adaptability of such programs to various on-campus departments in institutions of higher education; and fourth, to provide appropriate recommendations to administrative officers of the university as to the relative contribution of the program to the university.

Methodology

The group of students who had completed two evaluation phases of an outdoor survival program and two different CLASP (Creative Learning through the Application of Sociological Principles) groups, all involved in wilderness-type educational programs, were examined together with two control groups. The control groups were a conventional, on-campus beginning class in sociology, and a conventional on-campus T-group. A total of 201 students were examined in the analysis: 21 students who had completed the 2 outdoor survival-group phases, 61 in the 2 CLASP groups, 86 in the sociology control group, and 33 students in the on-campus T-group. There were 2 concurrent CLASP groups taught by 2 different instructors: 30 students in CLASP I and 31 in CLASP II. Since the groups were of necessity intact classes, robustness of statistical analysis, referred to by Stigler, (1973), was assumed for the analysis. An additional 271 students who had been readmitted after suspension, some of whom had qualified for readmission through a wilderness-type experience, were also examined.

Outdoor survival. Students in the survival group registered for Youth Leadership 480 (Outdoor Survival) at Brigham Young University, Summer and Fall semesters of 1971. The survival experience is a five-phase program following an initial two-day campus instructional activity. The 5 phases of the 30 day program are entitled Impact, Group Expedition, Survival, Small Group Expedition, and Solo. The Impact phase consists of 3 days of total or large group activities which include a 40-mile hike and living off the land. In the Group Expedition phase, separate male and female groups encounter a 70-80 mile hike and are involved in mutual goal setting and cooperative problem solving. In the Survival phase, the entire large group satisfy their total needs entirely off the land for a six-day period. In the Small Group Expedition, 4 to 5 students tackle cross-country problems for 4 to 5 days in an 80-mile hike. In the Solo phase, students are in a four to five day wilderness isolation situation. The survival experience program is based on the conviction that more is learned through active participation than through passive acceptance. Learning activities are specifically designed to develop greater self actualization.

CLASP. The CLASP program, which is an adaptation of a wilderness program, consists of seven phases: (a) first week: testing, simulating, and preparation; (b) second-third week: human relations and survival lab in wilderness (elements of outdoor survival adapted to sociological principles, theories, and techniques); (c) fourth-seventh weeks: post-wilderness community problem solving upon returning to campus; (d) eighth week: mid-term evaluation; (e) ninth-twelfth weeks: skilled experiences; (f) thirteenth-fourteenth weeks: reporting, sharing, discussing, and analyzing; and (g) fifteenth-sixteenth weeks: evaluation and grading.

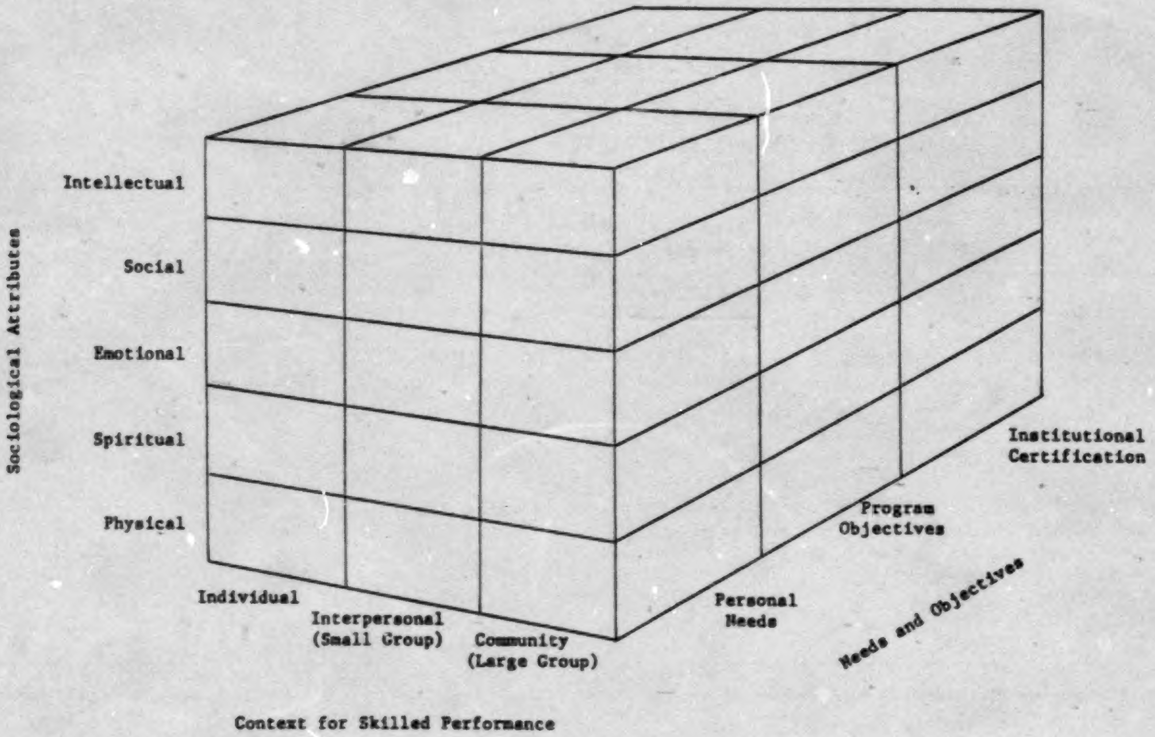
The CLASP program was devised as a "sociology semester" (Sundeen, 1972) with a nonstructured curriculum to help the student develop his own concepts, theories, and skills. The student is placed in an environment where he or she tests out relationships of his own emerging goals with those of other students and faculty. The student is given increasing responsibilities for self-direction throughout the semester.

Readmission. Students included in the readmission adaptation analysis are those suspended from the university for academic failure. The suspended students were readmitted through one of the following four different voluntarily selected programs: first, college work at another institution of higher education with a specified minimum grade point average (GPA); second, completion of specified correspondence courses with a minimum GPA: third, acceptance by a readmission committee in response to a special request of the student based on particular evidence of academic capability; and fourth, satisfactory completion of the outdoor survival training class (Youth Leadership 480). Sample sizes of the 4 groups examined in this phase of the study were 102 students in the College Work group, 58 students in Correspondence, 37 in Survival Program, and 74 in Committee Decision. Success of the survival program in preparing suspended students for readmission was measured in terms of both mean GPA and percent of students successfully completing their first semester after readmission.

Evaluation. Evaluation measures were administered to

Figure 1

INTEGRATED MODEL FOR EVALUATION AREAS OF COMPETENCY



provide a basis for statistical analyses of student changes in mental health, sociological content knowledge, and overall conception of the program. Mental health or self actualization was measured using the *Tennessee Self Concept Scale* and the *Personal Orientation Inventory* (POI). Although other types of self-concept measures have been used by some researchers (Clifford & Clifford, 1967; Stimpson & Pedersen, 1970; Treppa & Fricke, 1972), the Tennessee Scale and the POI have apparently had more widespread usage (Heaps & Thorstenson, 1974; Thorstenson & Heaps, 1973; Barcus & Bergeson, 1972; McClain, 1970). In addition to its use in identifying self concept (Foulds, 1971; Fox, 1968; Knapp, 1965), POI has been used by therapists as a diagnostic instrument to measure a patient's current level of positive mental health of self actualization (Shostrom, 1964). The POI also differentiates between groups of subjects representing different categories of self actualization (McClain, 1970; Shostrom, 1964; Fox, Knapp, & Michael, 1968). The Tennessee Scale and the POI were each administered in the form of pre and post tests to various survival, CLASP, and control groups.

Sociological content knowledge was measured by pre- and post-forms of final examinations. The final examination forms were constructed by Individual Learning Systems, Inc. (ILS) and were designed for beginning courses in sociology (Kinch, 1971). The ILS forms were administered to both CLASP groups and to a control group.

Students' overall attitudes toward the program were analyzed using follow-up questionnaires which asked the students to compare their CLASP semester with the best other semester of their university life in relation to: first, learning acquired; second, personal growth; and third, the "excitement" about learning.

Multidimensional evaluation. Snow (1974) suggests that there is a compendium of outcomes from any educational experience. Unexpected outcomes may result from new learning methods in unfamiliar surroundings involving undiscovered principles. Nontraditional methodology and outcomes suggest a need for a multidimensional research model. One dimension of a multi-dimensional model for evaluating wilderness-type programs shown in Figure 1 is the "Context for Skilled Performance" in terms of size of the group being evaluated, whether individual, small group, or large samples. A second dimension adds five sociological attributes listed in Figure 1 as intellectual, social, emotional, spiritual, and physical. The third dimension includes Personal Need Fulfillment, Program Objectives, and Institutional Certification. Adding the third dimension to the two dimensional model provides a more complete approach to evaluation and illustrates the complexity of the problem. Continuation of present research for longitudinal analysis is an essential part of the evaluation.

Results

Many differences in attribute changes for the wilderness-type groups over the control groups were significant. A certain amount of mental health improvement was found to be unique to the outdoor survival group. Some of the results from the CLASP group were consistent with those from the survival group, but others were different. Consistencies and deviations between results of the two programs can be expected since the CLASP program adapted only certain wilderness-type elements from the survival program.

The attributes in the *Tennessee Self Concept Scale* which were significant for at least one of the groups examined were identified in Table 1. Six of the attribute changes iden-

Table 1

SIGNIFICANT↑ CHANGES IN SELF CONCEPT FOR VARIOUS EXPERIMENTAL GROUPS IN WILDERNESS-TYPE EDUCATIONAL PROGRAMS

Attribute	Survival (Immediate)	Survival 1 year	CLASP I	CLASP II	Control Groups T Group	Control Groups Conventional Class
Physical Self	↑	↑	↑			
Moral and Ethical	↑	↑	↑			
Behavior	↑	↑	↑			
Self-Satisfaction	↑	↑	↑	↑		
Identity	↑	↑	↑			
Self-Criticism						
Personality Integration						
Social Self		↑	↑	↑		
Family Self	↑		↑			
Personal Self	↑	↑	↑	↑		
Total Positive	↑		↑			
Neuroticism			↓			
Personality Disorder			↓			
General Maladjustment			↓	↓		
Defensive Positive			↑	↑		
Number Deviant Signs						
Psychotic						

↑ Arrow denotes significant change, $p < 0.05$, between pre- and post-measure of the *Tennessee Self Concept Scale;* direction of arrow indicates positive (↑) or negative (↓) change.

tified in the Immediate results were also observable in the One-year results for the survival group: Physical Self, Moral and Ethical, Behavior, Self-satisfaction, Identity, and Personal Self. Two of these same attributes were also common to the results for both CLASP groups: Self-satisfaction and Personal Self. No significant change on the Tennessee Scale was found for either the T-group, or the conventional class. All of the attributes listed in Table 1 which showed significance were significant for CLASP I. The differences between the significant results for CLASP I and CLASP II can be explained in terms of different instructors for the group and individual differences between the two groups.

The results in Table 1 indicate a degree of permanency in certain attribute changes for the survival group. Certain attribute changes also appear to be common to each of the wilderness-type programs. No attribute changes were significant for the control groups. Finally, certain additional attributes are unique to the CLASP groups contrasted to the survival and control groups.

Significant changes for students in both CLASP groups were identified for five of the attributes in the *Tennessee Self Concept Scale* listed in Table 1. Four of the attribute changes unique to the CLASP groups are improvements in Neuroticism, Personality Disorders, General Maladjustment, and Defensive Positive.

Results of the POI test in measuring mental health or self actualization confirm the results from the *Tennessee Self Concept Scale*, in that none of the scales showed significant changes for the control groups, but five were significant for both CLASP groups.

Sociological Content Knowledge

The results, shown on Table 2, indicate that the CLASP program affected significant changes in the students' sociological content knowledge as measured by the ILS examination forms. The control group, a conventional on-campus beginning course in sociology, had no significant increase between scores on the pre- and post-forms of the ILS final examination test.

Readmission of Suspended Students

Students seeking readmission were given their choice among four methods of qualifying for readmission; academic work at another institution of higher education, correspondence work at Brigham Young University, successful completion of the survival program, or committee action on appeal.

Table 2

SOCIOLOGICAL CONTENT KNOWLEDGE OF CLASP AND CONTROL GROUPS AS MEASURED BY PRE- AND POST-TESTS[1] FALL SEMESTER 1973

Group	N	Pre-test		Post-test		Change
		X	S	X	S	
CLASP I	31	61.6	1.4	69.7	1.5	+8.1 sig.[2]
CLASP II	30	64.3	1.5	71.0	1.7	+6.7 sig.
Control	86	53.6	2.0	54.8	2.9	+1.2 n.s.

[1] Tests: Individual Learning Systems, Inc., Final Exam A. and Final Exam B. (1st Ed.)

[2] $p < 0.05$

The fact that there was no significant difference in mean GPA among the four groups indicates that the four methods used for readmission were equally successful as measured by mean GPA. The percent of students per group who obtained an acceptable GPA for their first semester after readmission is also listed in Table 3. Again there were no significant differences among the four groups, and the survival program was considered to be successful in qualifying students for readmission to the university. The academic success of students in the survival program was especially noteworthy since the program was basically nonacademic and was only 30 days in duration. If a student does not qualify for readmission otherwise, readmission through participation in the survival program could be highly recommended.

Non-Traditional Evaluation

Traditional evaluation seldom considered the students' feelings and attitudes about their experience in the program. Descriptive analyses were, therefore, made of the overall impact of the program on student participants in the CLASP program who were asked to make various comparisons of their CLASP semester with their best other semester. Approximately 89.7% of the participants rated their CLASP semester as the *best* overall semester in their college career, 6.9% rated CLASP *equal* to their best other semester, and only 3.4% rated

Table 3

COMPARATIVE ACADEMIC SUCCESS OF READMITTED* SUSPENDED STUDENTS

Option Selected to Qualify for Readmission	N	X GPA First Sem.	Std. Dev.	Cum. X GPA as of Sum. 1973	% of Group Successful
Academic Work at Other College	102	2.44	.91	1.90	78
Correspondence Work	58	2.33	.92	2.09	78
Survival Program (YL 480)	37	2.45	.80	2.10	76
Committee Action on Appeal	74	2.15	1.08	1.79	70

*Readmission Applicants 1969-1972

CLASP *below* their best semester. In addition, 96.6% rated CLASP as their best semester for the amount of personal growth obtained, and 96.6% rated CLASP as their best semester "excitement" about learning. The following excerpts are typical responses from students in the wilderness-type programs.

Male Student:

The contrast between my first semester and CLASP is overwhelming. It was like going from darkness into light. . . . This semester I spent hours in the library going down the shelves, reading whatever looked interesting. . . doing and learning because I was interested and wanted to.

Female Student:

I would spend two or three hours writing in my journal. . . I read ten books completely and started three others. . . I never worked so hard and spent so much time in terms of reading. Never before did (sic) I spend from seven in the morning 'til nine at night *in the library*.

Preliminary Conclusions

The results of the analysis thus far conducted indicate that students in wilderness-type programs improved in mental health more than students in the traditional courses; students in a wilderness-type sociological program excelled in sociological content knowledge in contrast to students in the traditional sociology course; and wilderness-type programs also helped prepare academically suspended students for successful readmission.

Participants reacted positively to the program and rated the program as the best experience in their university life. The success of adapting wilderness-type programs to some on-campus departments indicates that successful adaptation can be expected, but would vary according to the given department objectives.

A negative aspect is the risk of physical casualty, although most groups have reported no fatalities and few or no accidents. Another negative result of the CLASP program also appears to be in the area of "Defensive Positive" on the *Tennessee Self Concept Scale*. Further research is suggested to determine whether this attribute change is desirable or undesirable and whether the program should be changed to produce more desirable results.

Challenges for Future Evaluation

Additional research is needed to more completely define objectives of the programs and the techniques for evaluating their success. Existing tests are often used when it would be more appropriate to first structure the research approach to evaluate the program and then construct appropriate tests and measures.

A major problem in evaluating wilderness-type programs is isolating the phases of the program which contribute to a given change in the students' attitude and behavior. Further research is needed, therefore, to isolate the effective elements in the program.

Another challenge for the researcher is to identify the parameters of the various cells in the multidimensional model for evaluating wilderness-type educational programs. Research is needed to identify and measure possible unknown influences of the multiphase program, both immediate and longitudinal, in the lives of students. Another dimension of analysis is to examine the effects of motivation generated by the wilderness-type program on the students' academic success generally. Further research is planned to analyze academic success of readmitted students who were suspended on academic failure. Additional longitudinal analyses are also needed to determine the extent to which changes are retained by the students over a prolonged period of years and to determine the extent to which the changes are desirable.

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A RESPONSE TO THE NEED FOR "META-THEORY" IN EDUCATIONAL PLANNING: THE PRECEPTS AND APPLICATIONS OF THE PERRY SCHEME OF DEVELOPMENT

James M. Heffernan, Syracuse University

There is currently evident in the research and development literature of higher education a need for better measures of educational outcomes. Given our shifts to diverse kinds of students, learning environments, and expectations of education, what is increasingly required are useful conceptual frames for evaluation and planning. Such a framework should be: (a) broadly enough conceived to transcend the particulars of programs and institutions, yet richly enough detailed to provide differentiation and comparative analyses; (b) grounded in learning psychology, yet consonant with philosophical and normative standards; and (c) perhaps most important, intuitively valid to many constituencies—given the move toward increased participation in planning—so that it can be directly useful to faculty, student, and administrative committees as well as to research/development staffs.

The work of Perry (1968) of the Harvard College Bureau of Study Counsel provides such a framework. The Perry theory describes students' developmental processes in a unique way; viz., through *forms* of thought and *styles* of establishing values and personal identity. It describes how students progress in levels of thinking complexity, how that leads to a merging of knowledge and values, and how a sense of identity is established. It is a clinically based and empirically validated theory. It is also more than just another description of college student development. Because of its logic and thoroughgoing detail, it represents a compelling framework for an "ideal" educational process, a normative basis for judging educational outcomes. It draws upon, and draws together, much of our knowledge on both intellectual and personal development.

> This is the most original work on personality development of college students to appear since the field was founded twenty years ago . . . The book is an intellectual effort of the first caliber and has major implications for the art of teaching. (Freedman, 1973, p. 117)

This paper has a two-fold purpose: first, to outline the Perry Scheme of Development in order to promote broader awareness of a useful analytical framework; and, second, to describe the applications and refinements of the Scheme made by this author and others, including actual and potential uses in (a) student evaluation, (b) faculty development, (c) instructional development, and (d) program design and evaluation.

The Perry Scheme of Development

Origins of the scheme. The Harvard Bureau of Study Counsel is an undergraduate academic counseling unit which aids students with academic adjustment and study problems. It has been under the leadership of William Perry since 1947. Over the years Perry and his staff had become impressed with "the variety of ways in which students responded to the relativism which pervades the intellectual and social atmosphere of a modern university and an increasingly pluralistic society" (Perry, 1971, p.3). How students perceived and assimilated their experiences, and formed intellectual and personal perspectives in our pluralistic system of values seemed an important process, encompassing, as it did, both academic and personal domains. The desire to describe this process formed the initial impetus of their long-range research.

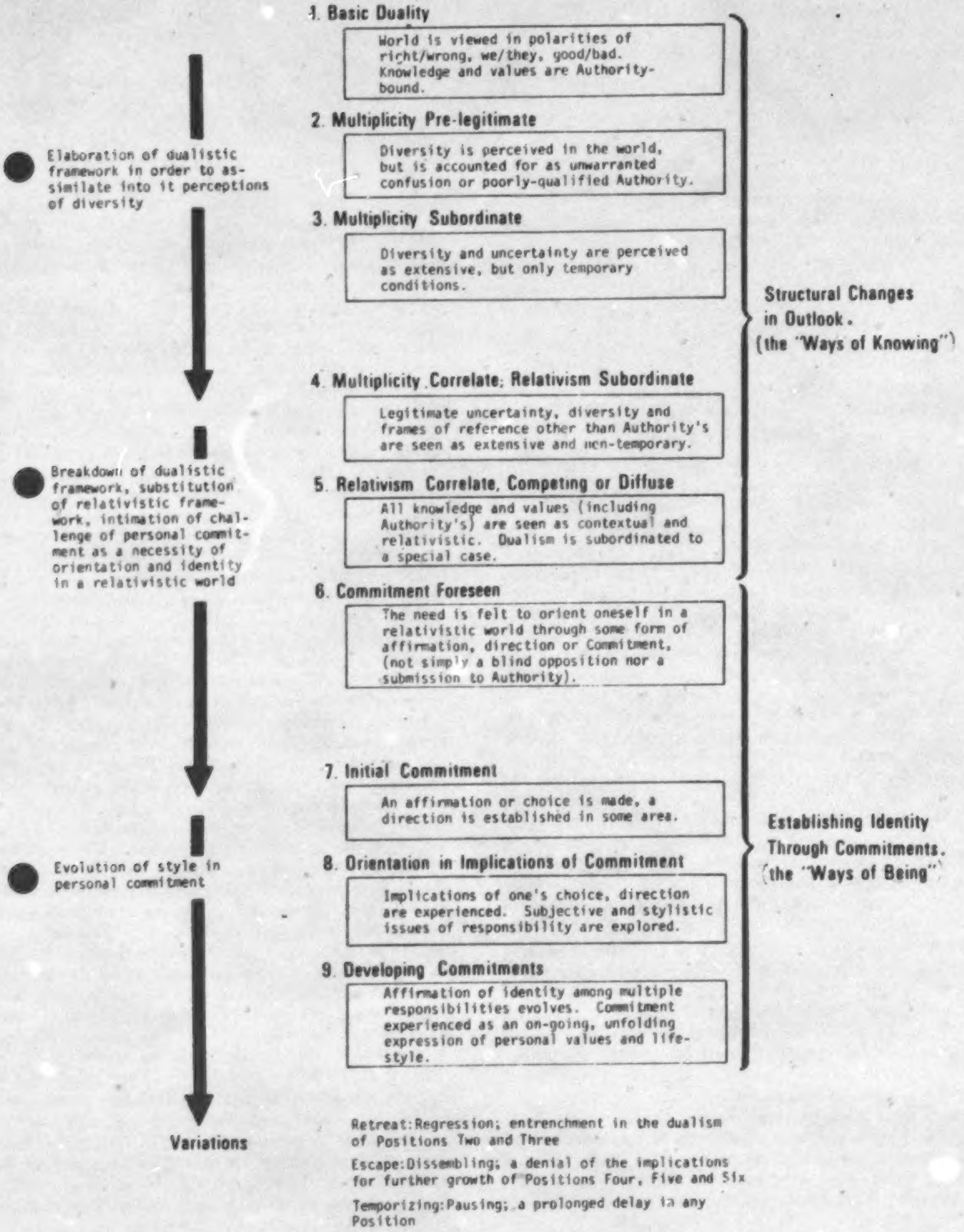
In 1953 Perry and the Bureau staff undertook the first of four stages of a project to document students' experiences and development during their college years. The first step in characterizing the variety of students' responses to "intellectual and ethical pluralism" was to determine how widely their conceptions ranged. A "Checklist of Educational Values" was designed to identify students' epistemological structures; i.e., their forms of thought, the ways they apprehended reality. The results indicated a conceptual hierarchy ranging from a level of right/wrong, black/white "Dualistic" structures to more balanced, contingent "Relativistic" forms of thought. That is, simpler forms of thought were expressed in "either/or" terms; "Truth" was an absolute. The more complex forms permitted exceptions, qualifications, and inconsistencies; "Truth" was relative.

The project's second phase was to interview a number of students from the Class of 1958 to elaborate the "forms of thinking" framework, and to examine further how students formulated personal perspectives on knowledge and values. After repeated readings of a series of longitudinal interviews, the Bureau staff "gradually came to feel that we could detect behind the individuality of the reports a common sequence of challenges to which each student addressed himself in his own particular way" (Perry, 1971, p.8). There could be discerned in the reports not only a progression in evolving thought forms, but also a progression in formulating one's personal values and identity styles. That is, students were seen to change, over time, in the ways they construed reality; their "forms of thought" could be seen as stages in a developmental process, not simply as fixed personal or cognitive characteristics. Second, and a vital point, students' attainment of a relativistic stance was seen to be a critical step in the process of achieving a sense of personal identity. Once a relativistic viewpoint was attained, students perceived that the next logical and necessary step was to make some commitments or affirmations about themselves, their beliefs, ideals, identity. The selection of such areas of stability (the acts of "Commitment") and the individual stylizing of their outward expression, and, ultimately, the undertaking of personal responsibilities were seen to round out the process of personal identity formation.

The third phase of the project involved the elaboration

Figure 1

DEVELOPMENTAL STAGES OF THOUGHT AND VALUE FORMS
The Positions of the PERRY SCHEME OF DEVELOPMENT



1. Basic Duality

World is viewed in polarities of right/wrong, we/they, good/bad. Knowledge and values are Authority-bound.

2. Multiplicity Pre-legitimate

Diversity is perceived in the world, but is accounted for as unwarranted confusion or poorly-qualified Authority.

3. Multiplicity Subordinate

Diversity and uncertainty are perceived as extensive, but only temporary conditions.

4. Multiplicity Correlate; Relativism Subordinate

Legitimate uncertainty, diversity and frames of reference other than Authority's are seen as extensive and non-temporary.

5. Relativism Correlate, Competing or Diffuse

All knowledge and values (including Authority's) are seen as contextual and relativistic. Dualism is subordinated to a special case.

6. Commitment Foreseen

The need is felt to orient oneself in a relativistic world through some form of affirmation, direction or Commitment, (not simply a blind opposition nor a submission to Authority).

7. Initial Commitment

An affirmation or choice is made, a direction is established in some area.

8. Orientation in Implications of Commitment

Implications of one's choice, direction are experienced. Subjective and stylistic issues of responsibility are explored.

9. Developing Commitments

Affirmation of identity among multiple responsibilities evolves. Commitment experienced as an on-going, unfolding expression of personal values and life-style.

● Elaboration of dualistic framework in order to assimilate into it perceptions of diversity

● Breakdown of dualistic framework, substitution of relativistic framework, intimation of challenge of personal commitment as a necessity of orientation and identity in a relativistic world

● Evolution of style in personal commitment

Structural Changes in Outlook.
(the "Ways of Knowing")

Establishing Identity Through Commitments.
(the "Ways of Being")

Variations

Retreat: Regression; entrenchment in the dualism of Positions Two and Three

Escape: Dissembling; a denial of the implications for further growth of Positions Four, Five and Six

Temporizing: Pausing; a prolonged delay in any Position of the general scheme into a Chart of Development, a Glossary of Terms, and a description of each of nine "Positions" or stages in the Scheme, and three transitional steps. A second, larger sample was drawn randomly from the Classes of 1962 and 1963; 109 students' reports through 366 interviews, including 67 complete 4-year reports, were collected by 1963. These interviews and the Chart of Development were then submitted to trained judges who rated them in terms of the developmental stages or Positions.

The final phase of the project was a series of validation studies funded by the U. S. Office of Education whereby inter-judge rating reliability was assessed. The reliability of ratings was high: judges agreed in independent ratings of the interviews for Position at a level of .815 and better ($p < .0005$). Other rating and validation techniques yielded similar results. (Further technical details are available in the final report to the U. S. Office of Education; Perry, 1968.)

Description of the Positions of the Perry Scheme: Figure 1 outlines the nine Positions which comprise the Chart of Development, as well as several other ways the theory can be laid out. Perry's terminology (in boldface type) may seem unnecessarily esoteric; the face validity of such terms as "Multiplicity Correlate," "Relativism Diffuse," or "Commitment Foreseen" is limited. The nine Position labels are only short-hand terms, however, for more complex concepts.

It is helpful initially to think of the nine Positions grouped into three major areas: the movement from Dualism to Relativism, the exploration of Relativism, and the evolution of Commitments and identity. Movement "up the scale" represents changes in the *forms* of thought leading to developing styles of personal identity.

The first three Positions deal with the way intellectual meaning is construed. They describe the personal epistemological frameworks through which students perceive and order knowledge and values. Moving upward through Positions One, Two, and Three represents a phase of elaborating and embellishing a dualistic thinking structure in order to assimilate into it perceptions of diversity coming from the "pluralistic universe" outside. The "ways of knowing," or epistemological forms, are expressed as polarities of right/wrong, we/they, good/bad. Authority is seen as absolute; there are "Right Answers" to be gained through hard work and learning "The Right Way." The student may perceive that things do not fit precisely into one dualistic box or another, but such uncertainties or evidences of pluralism are seen as only temporary, or as arising from poorly-qualified Authority ("*They* don't know their Answers"). Essentially, however, the forms of thought in these stages portray all knowledge and values in "either/or" terms.

The "middle third," Positions Four to Six, represent the breakdown of dualistic structures, their gradual replacement by a relativistic framework, and—as the first links with personal identity formation—a dawning realization of the need to make commitments or affirmations in the chaos of a world of Relativism. In these stages, legitimate uncertainty and pluralism ("Multiplicity") are recognized, and realms of knowledge other than those of Authority are encountered (e.g., the legitimately conflicting "expert views" on the causes and remedies for economic recession). Thus, both knowledge and values are seen in relativistic terms; context is recognized as a definer/qualifier of intellectual or moral "Truth." When a stage of Relativism is achieved, however, it is experienced primarily as a transitional period. The existential chaos, the "Sophomore Angst," of realizing that "life is all gray areas; there are no certainties" is an unstable one.

Coming to Position Six involves the realization that one needs to orient oneself through a series of decisions or affirmations ("Commitments") which begin to provide bases or anchors for personal meaning. These Commitments are defined in terms of content areas (e.g., one's vocation, academic activities, interpersonal relations) as well as stylistic balances (e.g., narrowness vs. breadth, self vs. other-directedness, contemplation vs. action). Commitment does not necessarily imply obligation nor dedication per the "Sunday School" notion; rather, it means arriving at some kind of personal affirmation or certainty in values, identity, or life-direction in any one of a number of areas such as social and moral values, politics, religion, or intellectual viewpoints.

The final three Positions are most clearly understood as evolutions of personal identity and individual styles. As opposed to epistemological "forms," "style" is less clearly a matter of structure, more an expression of balance between competing pulls (e.g., past vs. future, self vs. others). The tentative recognition of the need to orient oneself through Commitments, part of Position Six, comes to fruition in the "Initial Commitments" of Position Seven. That is, at Position Six, the making of Commitments is first discerned as a reasonable way to resolve the ambivalences of Relativism; at Seven, an initial Commitment is actually made. The particular *area* of choice is an individual matter; attaining Positon Seven is defined simply as "making the leap" to a choice. Stylistic balances are also further refined as an identity framework is elaborated. "I'm going to be a lawyer," gives way to "proverty law in my rural home region, with local political involvement later on. That's what my direction is. I'll be a man of local action, rather than one of very broad impact, or of scholarly contemplation." Once commitments are established and elaborated, the implications of "responsibility" and "involvement" are explored. Action and participation, and the implementation of one's life-direction, are key concerns.

The last two Positions represent the fuller flowering of individual life styles: "living in" one's Commitments, adjusting to and accomodating various life activities, such as vocation, family, community, and social life. Attainment of Position Nine was seen infrequently in the Harvard study. It is more likely a post-college occurrence, possible only in a broader social setting with additional role demands.

Findings. The prime thrust of the Harvard project was to develop and validate the Chart of Development and Glossary of Terms. In the course of that effort descriptive data also emerged, suggestive of further applications of the Scheme. In 1954 the mean freshman Position was Three. Five years later entering freshmen were rated at Position 5. Although the most recent data are not yet fully coded, freshmen of the Class of 1975 appear to be entering college at even higher Positions. Evidently, students are breaking with dualistic thinking structures in high school, and are well into Relativism by their college entry year.

Applications and Utility of the Perry Scheme

As an organizing framework for analysis of several vital aspects of higher education, the Perry theory is seminal for design, planning and evaluation. The following section will describe some of the actual and the potential uses of the Scheme. These examples are by no means exhaustive; they are included primarily to illustrate the variety of ways the Scheme can be made operational for research and development purposes.

The general objectives of these projects lie in four areas: (a) student evaluation, (b) faculty development, (c) instructional development, and (d) program and curriculum design and evaluation. Several have multiple and interrelated purposes which relate to more than one of these areas.

Student evaluation. The most extensive attempts to develop an instrument for assessing students' Position have been undertaken at the University of Wisconsin at Green Bay.[1] The Green Bay instrument is a short, 10-item self-rating, and descriptive scale which produces a Position score. It has been used to test 277 incoming freshmen in order to "further understand the context in which students are approaching their college experience" (Hartley, A. C. 1974, p. 8), and to "sensitize instructors to some of the questions regarding the psychological context of the educational process . . . " (Hartley, E. L, 1973, p. 1). Preliminary findings point up implications for curriculum planning: nearly three-fourths of the freshmen are at a stage of Relativism, Position Five, at entry. They, thus, manifest greater needs to explore the possibilities and implications of establishing commitments, responsibilities, and involvement, as opposed to breaking with Dualism. It is clear that the design of the formal curriculum (e.g., sequence, distribution) must attend to this fact.

The Green Bay group is also examining students' values through the *Rokeach Value Survey* and are relating these profiles to students' Positions on the Perry Scheme. The cross-validating and enrichment of their instrument is continuing. The short rating scale is also being used by Perry's staff in present studies of Harvard freshmen; the validity and the efficacy of paper and pencil instruments can, thus, be further examined in the light of Perry's more complex interview rating techniques.

A two year longitudinal and cross-sectional study is being conducted at Wellesley College to determine the Positions of women students.[2] Relationships between Position (forms of thinking, levels of identity) and attitudes toward teachers and learning roles, and the resultant impacts on curriculum and instruction are being examined. As an important extension to the original Harvard study, the special identity problems of women are being addressed. Two senior psychology theses are also utilizing the Perry Scheme in assessing high school sophomores and seniors in experimental and conventional settings, again to explore the developmental nature of thinking forms and identity styles in different settings.

A pilot project to assess Position among students ranging widely in age is currently underway at Manhattanville College. Relationships between thinking forms and adult life-stages and the implications for adult learners and adult educators are being explored.[3] This represents a most fruitful direction for extending the Perry theory; i.e., epistemological and identity development beyond the college years.

This author's involvement with the non-traditional sector in postsecondary education has led to a similar interest in the age-relatedness of the Perry scheme. It is my contention that movement "up the scale" need not end at Position Nine, but that a recurrent cycling through the Scheme, in a spiral rather than linear fashion, may characterize laterlife identity development. That is, given new life challenges and situations, one may go through a progression similar to the Dualism-Relativism-Commitment sequence more than once. The progression may be quicker and less intense, perhaps, but would likely manifest the same "re-centering" dynamics. The work of Levinson (1974) and Gould (1972) have provided us with empirical data on development related to chronological age. The links between these reformulations of identity and thinking structures certainly bear implications for non-traditional, adult, and life-long education. Instructional processes and program design for post-college age students are currently attracting much attention and the Perry theory is being utilized as a guide to work in these areas.[4]

Finally, the Perry framework can contribute to the processes of diagnosis, counseling, and educational and career planning for individual students. In the same way that "cognitive mapping" assessments are being utilized with diverse students, so, too, might assessment of students' thinking structures and identity orientations aid individual counseling efforts. An existing example is the manner in which Ottawa University (Kansas) utilizes the Perry conceptions in assessing students' educational needs and as a guide to establishing individual learning contracts.[5]

Faculty development. In 1974 Wellesley College received grants from the Lilly and Hazen Foundations to establish a year-long faculty development seminar related to revising the college curriculum, particularly the freshman year.[6] The discussions have relied heavily on the Perry work as an organizing framework for analysis and as a base point for exploring normative educational issues. Reports indicate that the seminars have been successful in fostering faculty interaction leading to course and program redesign. Ottawa University, University of Wisconsin-Whitewater, Ithaca College, and the Massachusetts Institute of Technology are among the several other colleges to have used the Perry concepts for faculty development purposes. As a starting point for discussions of important educational issues, it, indeed, has proved useful framework for focusing faculty planning efforts.

Instructional development. Perry's theory has been applied to both the processes and the content of college teaching. The processes in teaching college level mathematics and their relationships to students' concepts of knowledge, per the Perry framework, have recently been examined by Copes (1974), in a dissertation at Syracuse University. Copes' contention is that the presentation of the relativistic nature of mathematics is conducive to students' developing concepts of knowledge, and that certain teaching methods may be employed which reveal the creative and the transcendent aspects of mathematics. He also has examined the theoretical potential of a number of teaching models for creating environments supportive of such conceptual development. His work, a dissertation relating Positions to open versus closed learning styles,[7] and a proposed study on teaching effectiveness in terms of the Perry scheme at the University of Wisconsin-Whitewater[8] represent promising new directions in the improvement of teaching practices by conceptual rather than experiential guidelines.

Ottawa University's system of learning contracts represents a combined teaching-advising process which utilizes the Perry notions as guides to individual educational planning. Intellectual perspectives and readiness for commitments are considered in the design of *how* and *what* to study. The Perry work also figures heavily in the content of freshman seminars at Ottawa, as a focus for discussion and self-examination. The Perry book is also used as an instructional text in courses on college students in the Higher Education departments at Michigan, Syracuse, Buffalo, Minnesota, Massachusetts and Ohio State, among others.[9]

Curricular and program development/evaluation.

PERRY SCHEME

Most of the projects cited above have as their ultimate aim the improvement of academic curricula or educational programs. The Green Bay, Wellesley, Manhattanville, Empire State College, Ottawa University, and M.I.T. efforts have utilized the Scheme of Development as either an analytical framework for assessing program impact, or as a normative basis for developing new curricular formats which maximize the educational experience.

The Perry theory also provides a valuable starting point for evaluating existing large-scale programs. A proposal currently before the Fund for the Improvement of Postsecondary Education[10] seeks support to develop a state-wide system of institutional self-assessment. The proposed system includes a variety of paradigms or models for educational evaluation; among those of central importance is the Perry framework.

The final illustration of the utility of the Perry Scheme also represents the first application of the theory outside of the Harvard Bureau of Study Counsel. In 1969 this author used the Scheme as part of an evaluation of a large-scale program innovation, the University of Michigan Residential College (RC).

To evaluate the impacts of the Residential College, relationships between students' identity formation and the features of the RC program and environment were examined, vis a vis the Perry framework. The features which promoted movement from Position to Position were derived from the Scheme, and were examined in relation to the level and the focus of students' identity development.

Analyses indicated that movement "up the scale" involved, at different points, quite different processes and, consequently, required quite different features in a college environment. Specifically, movement in the earlier stages required a rather nurturant environment which would be inappropriate and stifling in later stages. Conversely, continued movement in the later stages required challenges and competence-testing which would cause immobility or retrenchment earlier on.

By linking aspects of the Scheme to specific features in a college setting—over 75 environmental variables are utilized—the first steps at operationalizing the theory as an evaluative framework were achieved. (Additional findings on identity development, sex differences, and program features, and technical details of procedures and methodology are reported elsewhere: Heffernan, 1971).

Attempts are currently underway[11] to coordinate the work of those making use of the Perry theory. As this "invisible community" of researchers, planners, and evaluators grows, so will the refinements, instrumentations and applications of the Scheme. It has been the intent of this paper to further such cross-fertilization, for there seems no more pressing a time in higher education when such conceptual and analytical frameworks need to be employed.

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1. Hartley, Eugene L. & Hartley, Allan C. Office for Educational Development, University of Wisconsin - Green Bay.

2. Clinchy, Blythe, and Zimmerman, Claire. Department of Psychology, Wellesley College, Wellesley, Massachusetts.

3. Papanek, Miriam Lewis. Department of Psychology, Manhattanville College, Purchase, New York.

4. Office of Research and Evaluation, Empire State College, Saratoga Springs, New York. Francis, John B. Department of Higher Education, State University of New York at Buffalo, Buffalo, New York.

5. Maher, Thomas. Office of Educational Research and Planning, Ottawa University, Ottawa, Kansas.

6. Gold, Arthur. Office of Educational Research and Development, Wellesley College, Wellesley, Massachusetts.

7. Johnson, Jack K. Office of the Dean, Hamline University, St. Paul, Minnesota.

8. Christener, Charlotte A. College of Letters and Sciences, University of Wisconsin-Whitewater, Whitewater, Wisconsin.

9. In addition to the work of Copes and Heffernan, dissertations using the Perry Scheme have been undertaken at the University of Washington, Wayne State University, University of Minnesota and the University of Florida.

10. Proposal submitted by State Department of Higher Education, Albany, New York.

11. This author, Perry, and several others are establishing informal communications to coordinate research and development efforts. Funding support to facilitate this communication and to promote research is now being sought.

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ADDITIONAL CONTRIBUTED PAPERS

ABSTRACTS

RESPONDING TO ZERO GROWTH—A MODEL FOR INSTITUTIONAL SELF-RENEWAL

Gordon William Kingston, Assistant Director, Center for Educational Development, University of Minnesota.

One of the serious problems confronting higher education in this era of adversity is how it might continue to promote change while its traditional sources of support are drying up. Heretofore, change was financed through higher education's ability to attract additional revenues. New ideas were tested while institutions continued to support existing programs. With resources shrinking, higher education must find new ways of promoting and testing new ideas in response to changing social needs without the luxury of an expanding resource base. In 1967 the University of Minnesota initiated the first of three programs which function as internal foundations for educational development. While not conceived specifically as responses to the zero growth phenomenon, it is clear that they function to ameliorate this problem. This paper describes these programs and the role they play in promoting change and renewal within the institution. Also described are the results of an evaluation of two of the three programs. Among the topics covered in the evaluation report are faculty acceptance and perceptions of the programs, perseverance of funded projects, and the impacts of the projects upon the faculty.

ACADEMIC PLANNING IN A LAND GRANT INSTITUTION: PRACTICAL PROBLEMS IN TUITION POLICY, BUDGETARY POLICY, AND INFORMATION

Stephen A. Hoenack, Director, Management Information Division, and Ronald A. Zillgitt, University of Minnesota.

Universities cannot look forward in the future to regular and large infusions of new resources like those they received in the past period of rapid growth. With the passing of the "bulge" in the college age population, academic planning will be increasingly focused on existing resources. Unfortunately, the early hopes that reallocations within universities could provide resources for feasibility and revitalization run against the extremely difficult (in our opinion, impossible) problems of measuring relative program benefits. Our conception of the environment of universities in the coming decades is that flexible resources for academic planning can be reliably achieved only through improved incentives for efficiency, improved pricing of services to students (tuition policy), and negotiation of long-term funding agreements with legislatures.

This paper describes a method of generating uncommitted resources at the University of Minnesota through a combination of (a) tuition policy, (b) long-term legislative agreements, and (c) internal budgetary policy. The tuition policy presented would make tuition rates proportional to program costs. An econometric analysis of the enrollment consequences of this policy is presented. The legislative agreement in combination with the tuition policy would lead to the development of uncommitted funds. The budgetary policy would provide improved incentives for efficiency and would provide a second source of uncommitted funds. At the same time, the budgetary policy would reflect the complexity of large universities and the tradition of faculty autonomy by placing maximum control over budgetary decisions affecting academic quality with decision-makers most directly concerned with academic quality. Finally, the paper discusses the benefits and risks of the policies, problems of information gathering and analysis, and means of implementation.

TEACHER—COURSE EVALUATION: A LONGITUDINAL STUDY OF RESPONSE STABILITY AND INSTRUMENT RELIABILITY

Charles W. McCollester, Coordinator of Analytical Studies, Michael Collins, Office of Dean of Administration, Erik

Freitag, University of Notre Dame, and Timothy H. Poley, Xerox Corporation.

Data gathered from the formal evaluation of teacher competence and course content adequacy further the completion of many administrative tasks. The role of students in this evaluative process has come to be regarded as crucial; consequently, teacher-course evaluations (TCE) by students are now common college practice.

Nevertheless, there is little agreement on the weight properly assigned TCE in the decision-making process. Although there are persuasive data suggestive of TCE reliability, the quality of TCE responses is still debated. For example, the stability of TCE over time remains largely unexplored, statistically, although frequent, unsupported hypotheses assert that student perceptions of teachers and courses change drastically over the years. The present study is directed toward this problem.

TCE responses of a sample of freshmen in 1971 are compared with their responses as Seniors in 1974. Of primary interest are (a) the stability in item-by-item responses and composite evaluation, (b) stability of instructional factors, and (c) suggestion of a causal model of the TCE process in terms of instructional and non-instructional inputs.

While the present study is exploratory, it is intended to point the way toward the improvement of TCE instruments and to suggest ways in which the quality of student evaluation may be better measured.

INFLATION INDICATORS IN HIGHER EDUCATION

G. Richard Wynn, Director of Operations Analysis, Educational Ventures, Inc., Cedar Crest and Muhlenberg Colleges.

This presentation summarizes a recent study of inflation in liberal arts colleges. There are two major foci: (a) the use of inflation measures in the management of institutions of higher education; and (b) how institutional research officers can develop specific measures of the inflation affecting their institutions. Although the study was limited to hard data from liberal arts colleges, the methodology applies to all types of institutions.

Among the major findings: Liberal arts college inflation from 1964 to 1973 was 1.6 times that of the Consumer Price Index (CPI) and other general measures. Thus using the CPI as a proxy far understated the true burden that inflation imposed on higher education. Recently higher education inflation slowed, primarily at the expense of real wages of employees. Differential rates of inflation impacting on programs within an institution were identified: the implications for internal resource allocation will be discussed. Factoring out the effects of wage/price changes, "constant dollar" growth for higher education has slowed dramatically. For the colleges studied, fewer real resources per student were spent in 1973 than in 1970, and the "steady state" is a reality.

A Limited and a Comprehensive Model for measuring inflation in higher education is outlined. Both use the same formula, but differ in the coverage of the "market basket" of items priced. Specific methods of pricing the market basket are diagrammed and discussed. An institution must resolve the trade-off between the speed of preparing the Limited Model and the greater accuracy of the Comprehensive Model.

THE RELATION OF DISPARITY IN STUDENT AND FACULTY EDUCATIONAL ATTITUDES TO EARLY STUDENT TRANSFER FROM THE COLLEGE OF ORIGINAL ENROLLMENT

Joan Stark, Chairman, Department of Higher Education, Syracuse University.

Educational attitudes of entering students and full-time faculty at a liberal arts college for women were measured by the Student Orientation Survey (SOS) and the Faculty Orientations Survey (FOS). Attitudes of students who transferred from the college prior to the sophomore year were similar to those who remained on dimensions of educational purpose, peer relationships, and public position. Attitudes of transfers differed significantly from remaining students on dimensions concerned with the process of education and faculty-student power relationships. The disparity between faculty and student attitudes on these same dimensions of process and power was greater for students who transferred than for students who remained. Implications for adapting the curricular-instructional process to reduce attrition are discussed. Suggestions are made for extending the study to identify possible relationships between disparity in faculty-student educational attitudes and attrition at other institutions.

NEW TECHNIQUES FOR PREDICTING AND CONTROLLING ENROLLMENT

L. Lloyd Suttle, Office of Institutional Research, Yale University.

Yale College faces an increasingly complex problem of predicting and controlling enrollment. For both financial and educational reasons, enrollment must be maintained at or near (but never over) the College's fixed capacity level in every term. Yet the increasing diversity of student attendance patterns has resulted in overcrowding in some terms and vacancies in others. The introduction of a voluntary summer term in 1975 seems likely to exacerbate these problems. Conventional methods of enrollment planning, based largely on simulation techniques and trial-and-error estimates of the correct size of each entering class, offer inadequate solutions to these problems.

A mathematical model is developed which uses optimization techniques to determine the number and type of students that should be admitted each term, given specified capacity constraints and specified assumptions about summer term enrollment, student attendance patterns, and degree residence requirements. By systematically varying these input constraints and assumptions in different runs of the model, it is possible to analyze the impact of the summer term and of related policy changes on fall and spring term enrollment, and to identify ways to control enrollment in light of these consequences.

The application of operations research modeling techniques for enrollment planning at other universities is discussed. The model should be especially useful for those schools considering year-round operation or having a greater number of qualified applicants than can be admitted. Finally, some of the difficulties encountered in seeing that this type of "computer-generated policy recommendations" is actually used by university and decision-makers are examined.

FACULTY EVALUATION POLICIES AND PROCEDURES IN HIGHER EDUCATION

Carl H. Rinne, Assistant Professor of Education, University of Michigan, Flint.

Some institutions have no meaningful written statements on faculty evaluation policy and procedures: other institutions have elaborate documents. *All* institutions need to review periodically their policies and procedures, written and unwritten, to ensure that equity and adequacy are provided. The question is not *whether* such review should be done but rather *how* it should be done.

The problem is that faculty and administrative decision-makers often feel they do not have time to study thoroughly even the critically important problem of faculty evaluation. What can be done to enhance the quality of decision-making in faculty evaluation policy at the least cost in time? This four-part paper provides an ANNOTATED AGENDA for faculty and administrative meetings on faculty evaluation policies and procedures.

Part I is a list or "map" of specific procedural options among which decision-makers must make informed choices as they review or propose policies for faculty evaluation. The list is comprehensive, and the choices are easily understood.

Part II annotates the list of procedural options with brief statements of research findings, of current university practice, and of professional opinions throughout the country. While the annotation is not exhaustive, it is reasonably representative of major views and events.

Part III discusses topics in faculty evaluation which are not routinely considered in evaluation policy but which should be: faculty work load, professional status vs. professional growth, and academic standing.

Part IV presents or refers to sample instruments which have been or may be used in various faculty evaluation procedures.

"IT'S NOT A GIMMICK BUT A MUST!" TOWARD ACADEMIC INSTITUTIONAL ANALYSIS

Charles E. P. Simmons, Vice-President for Academic Affairs, and Manfred Schauss, Office of Academic Affairs, University of Evansville.

The approach will be one to shock and show the need for greater awareness of management information operating systems. We will basically deal with the strategy in management information systems which becomes invaluable to the academic vice-president. It is the strategy aspect of the management systems approach which has been, at times, perverted by individuals or even suborned by those who do not wish to use the information they have at their disposal. Along with the question of strategy is the entrepreneur activity of the administration, the question of alternatives. There are options; there are variables. The choice must be based on reality, the *myth*. Once can model myths. You are only as strong in your options and your variables as the information at your discretion.

The roles of the academic vice-president and director of the computer center become vital to be able to present to the faculty in ways they can understand what their particular individual productivity is or what the particular activity of the department is and what the particular activity of the school and college is. The academic vice-president, having used cost modeling and modeling in general, can start with a base and project budgets, enrollments, and percentages. He, with the director of the computer center, can even model for the faculty to see, and most faculty are capable if they are shown, a pessimistic budget, a likely budget, and an optimistic budget through some 20 iterations. You cannot, as some academic administrators want to do, take a pencil and desk calculator to do this. You must sit down and work with a management institutional analysis system. The results can be dramatic at an institution if they are seeking a reassessment and a reaffirmation of their own goals and are looking toward a new and revitalized mission.

THE USE OF STUDENT-RELATED OUTCOME DATA IN DECISION-MAKING: THE EXPERIENCE OF ONE LARGE PUBLIC UNIVERSITY

Franklin L. Duff, Associate Director, Bureau of Institutional Research, University of Illinois.

The University of Illinois has conducted comprehensive mail surveys of its graduates of the past two years. It now has machine-readable records for over twelve thousand of its 1972 and 1973 graduates, containing a variety of data concerning the vocational educational experiences and perceptions of the graduates concerned.

The paper discusses the ways in which results of the two surveys of graduates are being used to meet the needs of various decision-makers within and outside the institution, including administrators, special internal task forces, students and their advisors, and prospective students. This part of the paper focuses in great part on the steps taken to translate data from the surveys into terms and formats useful to such groups.

Some conceptual and methodological problems and issues associated with follow-up studies of student-related outcomes also are covered, for example, those relating to invasion of privacy, sensitivity of data, and limitations of the findings.

The paper discusses the importance to an institution of an organized program of continuing follow-up studies of the experiences and success of its graduates. The program developed at the University of Illinois is cited as one such plan.

Finally, selected overall results of the University of Illinois surveys, especially those applicable to higher education in general, are presented.

THE USE OF STATISTICS IN PUBLIC POLICY IMPLEMENTATION: A LOOK AT AFFIRMATIVE ACTION

Elizabeth A. Abramowitz and Samuel P. Wong, Senior Fellows, Institute for the Study of Educational Policy, Howard University.

Federal emphasis on affirmative action in employment has elicited from institutions of postsecondary education a plethora of statistical techniques and rationales explaining the employment patterns of the institutions. As a description of the disparity between the current employment patterns of an institution and the current available and eligible employees, statistics are indispensable for the enforcement of affirmative action. Some institutions, however, rely on the probability framework as the explanation for their current employment patterns. The transposition of a chance model onto a life situation in which deliberation is the operative norm is an abuse of statistics.

We discuss several crucial issues relating to the use of statistics in affirmative action and suggest that if statistical tests are necessary they should be simple statistical tests. We indicate some nonparametric statistical tests usable for different stages in the employment cycle in an institution of higher education and maintain that the integrity of these statistical tests must be upheld in each situation. We consider the problems of defining the university of available and eligible employees, and we also deal with some of the problems inherent in utilization anaylsis, recruitment and salary analysis, and advancement in institutions of higher education.

EVERYTHING THE ADMINISTRATOR REALLY WANTED TO KNOW

Mary Jo Kishel, Planning Analyst, and James S. Martin, Management Systems, Office of the Vice-President for Administration, University of Colorado.

The authors contend that institutional researchers, although relieved of routine data management tasks by available sophisticated software, are confronted by a new issue—information overload. As stated in the Newman Report, the current problem appears to be that "the enormous volume of data collected often stands in the way of collecting the right data." A further dilemma is created by the expanding multiplicity of data structuring and modeling techniques. Appropriate sets of transactional data may be collected, but without uniform or compatible classification, and usually without consideration of output utilitization beyond the unit which generates the input.

The essential expectations of decision-makers, however, remain constant: a comprehension of the nature of the total institution, such that changing issues and policies may be evaluated for effects on the status quo and decisions made which consider the identifiable trends and goals of the relevant operational components. The decision-maker must be provided with a continuous flow of succinct and relevant information, constituting an "awareness environment," which enables him to make most daily decisions with confidence, and to know when and what specific additional data are necessary for successful confrontation with unique, "one time" decisions.

The authors attempt to identify conceptual and technical pitfalls encountered in translating hard data into information relevant to decision-making. Mere implementation of advanced technology is insufficient without consideration of the decision-making environment of the institution and the data utilization objectives of the decision-makers.

Salient concepts discussed include: (a) the interrelationships between decision-makers and their decisions at various levels; (b) multidimensional techniques for data reduction and analysis; (c) the prerogatives of decision-makers and points of participation in systems development; and (d) effective analytic techniques (sampling, factor analysis, etc.) for large scale data bases.

BRIDGING THE INFORMATION GAP: A STRATEGY FOR INSTANT INSTITUTIONAL INFORMATION SYSTEMS

Eric Brown, Director, Office Institutional Research, Brown University.

This is a case study of an institution which was faced with information needs that could not be met by the current manual systems. To solve this problem, the institution elected a different path from the traditional development of automated data bases. The strategy chosen was to work with offices which had manual data bases to develop on-line operating systems using the standard software package available on an academic computer without additional programming or detailed systems analysis. The case study deals with the concepts which made this approach feasible, the actual implementation of this system in the Office of Financial Aid, the impact on that office and on the University management information system, and the capabilities for institutional research. An examination is also made of the cost implications of using this strategy versus the more traditional pattern of systems analysis, program development, and operation of a batch processing system. Finally, the case study examines some of the constraints and problems involved with this type of approach, to permit other institutions to make a better assessment of the costs and benefits of utilizing this somewhat unorthodox route.

COMPREHENSIVE DESIGN FOR INSTITUTIONAL RESEARCH IN SUPPORT OF PROGRAM DEVELOPMENT: THE OTTAWA EXPERIENCE

Tom Maher, Director, Research and Planning, Ottawa University.

This presentation deals with an effort to support the development of a new educational program through a comprehensive design for institutional research. Based upon the expreience of Ottawa University, a discussion of the way in which a small college utilizes information will provide a frame of reference. Within this framework, the necessity of various kinds of information usage will be explored. Ottawa's experience suggests that information which supports decade-long planning differs from the type of information which shapes year-to-year planning. Another kind of data is needed to enrich operational decisions. Finally, the alternative roles open to the academic planner are discussed and the consequences highlighted.

SELECTION CRITERIA FOR PART-TIME FACULTY

Suzanne W. Larsen, Assistant Director, Office of Institutional Research, University of Tennessee.

This presentation addresses the results of a survey of selected state institutions of higher education in the Southeast regarding the criteria for selection and pay-rate basis of part-time faculty. The institutions represent state universities and land-grant colleges, regional universities, and the separate campuses of multi-campus institutions. Using the variables addressed in the questionnaire, comparisons will be presented based upon categorization by type (multi-campus, state university and land-grant, and regional), location (urban vs. non-urban), and size of student body.

DETERMINING STUDENT SERVICE NEEDS FOR CONTINUING EDUCATION STUDENTS

Fred J. Wetzel, Director of Student Financial Aid, Middlesex Community College.

A three-part survey was administered to Continuing Education students at Middlesex Community College. Part I identified demographic subgroups within the Continuing Education population. Part II asked students to judge the present and desired importance of 30 student services objectives. Part III provided students the opportunity to select a preferred total program of student services as well as express a commitment to the program selected.

Demographic characteristics in Part I were analyzed separately for two groups which showed different frequency of response to items in Part II ("respondents" and "non-respondents"). The set of responses from "respondents" in Part II was used to generate the median response for the present importance given to each objective as perceived by the students. Median desired importances were also determined. A difference value for each objective was calculated. Items eliciting the highest and lowest response rates are discussed. Items showing the most and least current perceived emphasis are also discussed, as are items which show the highest and lowest desired importance. A final analysis deals with items showing the largest and smallest difference scores.

In Part III cross tabulations (preferred program versus financing methods) were developed for both respondent and non-respondent groups. The interaction of ideal program of student services with strength of commitment to the program (operationally defined as student willingness to assume a proportion of the program's cost) is discussed. Following this analysis, the paper makes recommendations for student services program development based on the joint outcomes of demographic, objectives, and program selection sections of the survey instrument.

INFORMATION FOR DECISIONS ABOUT QUALITY IN GRADUATE EDUCATION

Mary Jo Clark, Research Psychologist, Educational Testing Service.

This research-in-progress report on efforts to assess several dimensions of quality in doctoral programs of study reviews the procedures used to identify important and measurable characteristics, and summarizes efforts to collect the indicated information from program participants (students, faculty members, and recent alumni) as well as from departmental records. Data collection is taking place this spring in the departments of chemistry, history, and psychology at about 20 randomly selected universities across the country. The report gives special attention to apparent differences between disciplines and between programs with different emphases (e.g., to train researchers, teachers, or practitioners) in the kind and quality of information that is available. Some possible uses of the study results for doctoral program improvement, program evaluation, and increased information to prospective students are suggested.

AN EVALUATION OF THE IMPACT OF STUDENT FINANCIAL AID ON THE COLLEGIATE AND POST-COLLEGIATE ACHIEVEMENTS OF RECIPIENTS AT WASHINGTON STATE UNIVERSITY

Eric L. Jensen, Washington State University.

This study will use a status attainment model to assess the impact of student financial aid programs on the achievements of a cohort of freshmen entering Washington State University in the fall of 1970-71. We will examine the effectiveness of financial aid in reducing the links between the students' socioeconomic origins and their collegiate achievements, early occupational attainments, and earnings. This study can serve as a prototype for the continued monitoring and subsequent evaluation of the effects of financial aid programs at other campuses. The resulting model will assist institutions in the effective allocation of limited student aid funds, enable schools to demonstrate the impacts of their student aid programs, and provide support for their requests for funds from governmental and private sources.

THE TREND TOWARDS MULTIVERSITIES: A CASE OF INCOHERENT HETEROGENEITY

Gerhard W. Ditz, Professor, Department of Sociology and Anthropology, Eastern Illinois University.

Assuming that the ongoing recession in Higher Education requires major adjustments, the proposition here is that significant amerliorative changes could be made by institutionally reducing the multiplicity of competing goals, conflicting policies, heterogeneous functions, which characterize the American "Multiversity." The main target of the critique is the historically identified trend in American Higher Education to institutionally amalgamate liberal with vocational goals. This amalgamation is projected as the major single cause of other incongruities, which confound our postsecondary education system; contradictions between egalitarian and elitist principles, bureaucratic authority-structures. The educators who, together with the students, are the principal victims of the current education crisis may profit from the here-presented arguments by considering that the cure of the malaise in Higher Education may require structural-functional changes rather than waiting for an improvement in enrollment, funding, and other visible indexes of the crisis.

INFORMATION GATHERING PROCEDURES FOR CURRICULAR DECISIONS

Glenn F. Nyre, Evaluation and Training Institute, University of California at Los Angeles.

A process by which ideas and information can be gained from a wide range of constituents and the results of which can be submitted to evaluative procedures relative to curricular modification is currently being undertaken by the Evaluation and Training Institute for the School of Dentistry at UCLA. The setting in which the project is taking place is secondary to the procedures being used, as a dental school approximates a microcosm of an institution, with divisions, specializations, and a diversity of styles, methods, and content ranging from psychological and sociological considerations to almost "mechanical" skill tasks. The processes are applicable to any level or situation in education. Additionally, it is not a singular model, but avails itself to many modifications depending on the types of decisions to be made and the institutional dynamics involved.

To assure that there is a realistic relationship between exposure within and performance outside the academic setting, measurable outcome goals focusing on what the graduates will actually be doing once they have left the institution have been formulated for courses, sections, divisions, and the total School. Students, faculty and graduates all had input into goal formulation by means of faculty development workshops, faculty-student-graduate dialogues and a modified delphi technique. The same processes were used to establish an on-going procedure by which the attainment of the goals can be measured. With maximum input at all stages from all of the School's constituent groups, the curricular decision-making process was accomplished with a much wider range of information and shared responsibility than is typically available.

AN OPTIMAL FACULTY ASSIGNMENT MODEL

K. M. Hussain, Professor, Department of Computer Science, New Mexico State University.

In resource prediction models used in planning for higher education (like CAMPUS & RRPM), an implicit assumption is made that faculty are substitutable within an administrative unit. Within such a unit, the shortages of faculty are balanced against the overages. This does result in inaccurate predictions for administrative units (departments) where there is little or no such substitutability (which is often the case). This problem can be overcome by using a Faculty Assignment model such as discussed in this paper. In it the structure of the model will be discussed along with its uses and limitations.

There are two important byproducts of this model. One is its use at the departmental level in the simulation mode. It could then generate the faculty resource consequences of different planning strategies such as different mixes of faculty ranks, faculty teaching assignments, and faculty preferences. Such uses will be briefly discussed.

1. *Faculty Tenure*, Commission on Academic Tenure, 1973, pp. 50-51.

Another byproduct is the calculation of the Faculty Teaching Relevance Index. This index could be used as a criterion in evaluating faculty not only for promotion and tenure but also in hiring and retrenchment. The construction of this index is discussed along with its use and possible misuse.

The data requirements of the model are also discussed. The basic data is the Induced Course Load Matrix used by most planning models.

SELF-SELECTION DURING ADMISSIONS: INVESTIGATING THE IMAGE OF A COLLEGE

Andris Grunde, Research Group for Human Development and Educational Policy, State University of New York at Stony Brook.

Perceptions or images of a college can frequently be a strong influence in the admissions process that is beyond the control of admission officers. Traditional forms of communication from college to prospective student do not intervene in the channels of communication by which college reputations and images are transmitted. A methodological model for investigating a college's image is presented. Preliminary work, which can be undertaken with interviews or semi-structured open-ended questionnaires, should first establish the global aspects of the image if these are not already known. When this is accomplished, the image can be investigated with the tools of survey analysis. Background or demographic variables can be collected either from admission files or from the questionnaire itself. The central feature of the questionnaire is a list of college attributes or characteristics which speak directly to the institution's image. Response to each attribute is made on a 3 or 4-point scale. When constructing the scale and writing the instructions, it is very important to combine both the perceived fact of an institution (its image) and the evaluation that respondents make of that perceived fact. These items are then treated as the independent variables in a step-wise multiple regression analysis; tabular analysis can also be done, if desired. What is taken as the dependent variable can vary with the institution and its unique problem. If the problem is large numbers of admitted students who decline, then the dependent variable should be the admit-accept/admit-decline dichotomy; if a declining admissions pool, then the dichotomy between those who apply for admission and those who do not should be dependent.

EVALUATION OF THE PSYCHOSOCIAL IMPACT OF COLLEGE PROGRAMS: A RESEARCH EXAMPLE

Alan Waterman, Department of Psychology, Trenton State College.

The evaluation of innovative educational programs at small liberal arts colleges is usually carried out in either of two ways. In instances where grant monies are available, elaborate study projects may be conducted under the direction of outside research staff. Where such funds are lacking, the evaluation may consist of little more than the collection of impressionistic data at the conclusion of the project. A third type of procedure is described which requires minimal expenditures and involves the active participation of interested campus personnel.

Briefly outlined, the procedure entails the following:

1.) Identification should be made of the personnel on campus with research skills in the areas of student development and/or program evaluation.
2.) One or more of these individuals should be invited to participate in the planning of the new program so that the plan for evaluation can develop as an integral part of the program itself.
3.) The tasks of data collection and subsequent scoring can be carried out by the project staff, other interested campus personnel, or work-study students following suitable training.
4.) The analysis of the data should be carried out under the direction of the program evaluators and may involve computing center personnel or work-study students.
5.) Finally, the tasks of report writing and dissemination of the results may involve the participation of any of the individuals active in the project and its evaluation.

A study of the psychosocial impact of a living-learning center at Hartwick College serves as an example of this procedure in operation.

A HOME FOR INSTITUTIONAL RESEARCH: ACADEMIC VS. ADMINISTRATIVE

Molly Broad, Director, Office of Institutional Research, Syracuse University.

Offices of Institutional Research often divide into two types corresponding to the seemingly disparate cultures of academic affairs and administrative operations. The more prevalent link with administrative operation reflects the current emphasis on external reporting functions, internal data collection, and fiscal retrenchment. The immediacy of such institutional concerns often overshadows the qualitative concerns and approaches of academic administrators.

Yet, most efforts to articulate a role for Institutional Research which is common to the academic-administrative cultures fail to appreciate the extent to which these two speak different languages, perceive different goals, and value different conceptions of a university. As a result, an OIR may search in vain for a least common denominator, or in the other extreme for a way to translate the prevailing concerns of one culture into the other. The perspective of this paper is that a *Gestalt* of each culture, rather than a focus on overlap, is what is required; that an OIR should operate much like a two-way ethnographer rather than a bilingual relayer.

Finally, there is a brief examination of several specific attempts at integrating such diverse administrative problems. In the case of PPBS, there have been many failures. Our own experience offers, if not some positive conclusions, some hopeful signs.

NEW DIRECTIONS FOR ADMINISTRATION (A REDEFINED BOARD)

Marvin Z. Zuker, Barrister-at-Law, Ryerson Polytechnical Institute.

Boards of Governors hire Presidents, the administrative staff, and the faculty. Their policy determines which students may be admitted and which may not. All of these people may therefore be indebted to the Board.

From personal observation with respect to community colleges there does not appear to exist any particular science of administration, but rather a hodgepodge of ideas garnered from business, secondary schools, and universities without the benefit of much analysis as to how well these ideas relate to present problems. The traditional line-staff administrative organization patterns with emphasis on a unity of command are inappropriate in these schools.

If you relinquish certain rights in the decision-making process to students and faculty, does this leave the governing body without appropriate authority? Barnard defines authority as "the extent to which one individual within an organization will accept the directives issued by another." Simon discusses the relationship of authority as one which "involves power to make decisions that guide the actions of another."

As a postsecondary school instructor I have sometimes resented the traditional concept of authority which relies upon the assumption of a superior-subordinate relationship in decision-making, and so also, I might add, do students.

The trend today seems to be away from simplistic notions of authority, i.e., the stereotyped organizational chart, to that of group decision-making. Early researchers such as Maslow, McGregor, Herzberg, and others concerned themselves with human needs and a hierarchy of such needs. Many of the dysfunctional aspects of a bureaucratic model would be eliminated if we assumed that the primary focus of professional staffs should be upon problem-solving rather than coordination.

What about the hypothesis that authority is delegated upward rather than flowing downward? Boards may be educated by a wise president or manipulated by a clever president. The administration may influence a board, but legally and in fact, Boards are not responsible nor accountable to their administrative officers.

Who then do community college Boards represent? The students? The faculty? The community?

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